

## ENGINEERING DATA SHEET

Sheet No.

Date

Prepared

Checked

Approved

From KWOK and SADWELL 10/25/89

## SUBMITTAL I (PROPOSAL)

VWO+OP	889,428	8008	477HB165	7-11-80
VWO+NP	849,834	8028	477HB166	7-11-80
RATING	820,000	8010	477HB167	7-11-80
VP3	748,085	8012	477HB168	7-11-80
VP2	550,000	8260	477HB169	7-11-80
VP1	380,000	8700	477HB170	7-11-80

## SUBMITTAL II (PROPOSAL - REVISED)

VWO+OP			477HB165	9-16-80
VWO+NP	850,058	8006	477HB166	9-16-80
RATING	820,034	7989	477HB167	9-16-80
VP3	550,000	8144	477HB168	9-16-80
			477HB394	10-15-80
			477HB395	10-15-80

## SUBMITTAL III (CONTRACT AWARDED)

VWO+OP	889,470	7981	478HB460	1-28-81
VWO+NP	849,906	8001	478HB461	1-28-81
RATING	820,000	7982	478HB462	1-28-81
VP3	748,305	7982	478HB463	1-28-81
VP2	550,000	8121	478HB464	1-28-81
VP1	380,000	8574	478HB465	1-28-81

## ENGINEERING DATA SHEET

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## SUBMITTAL IV ( RELEASED TO GE DESIGN )

VWO+OP	891,886	7793	481HB112	6-24-81
VWO+NP	851,733	7816	481HB145	7-17-81
RATING	820,000	7816	481HB111	6-24-81
75%	615,000	7934	481HB146	7-17-81
50%	410,000	8394	481HB147	7-17-81
25%	205,000	9587	481HB148	7-17-81

## SUBMITTAL IV ( W/ DESIGN CHANGE ) .

VWO+OP	889,316	7821.7	481HB784	6-10-82
VWO+NP	849,189	7846.8	486HB249	10-29-82
RATING	820,000	7842.7	481HB786	6-10-82
100% MSF	817,732	7843.4	481HB785	6-10-82
75%	615,000	7962.4	481HB787	6-10-82
50%	410,000	8369.4	481HB788	6-10-82
25%	205,000	9572.5	481HB789	6-10-82

IP7010312

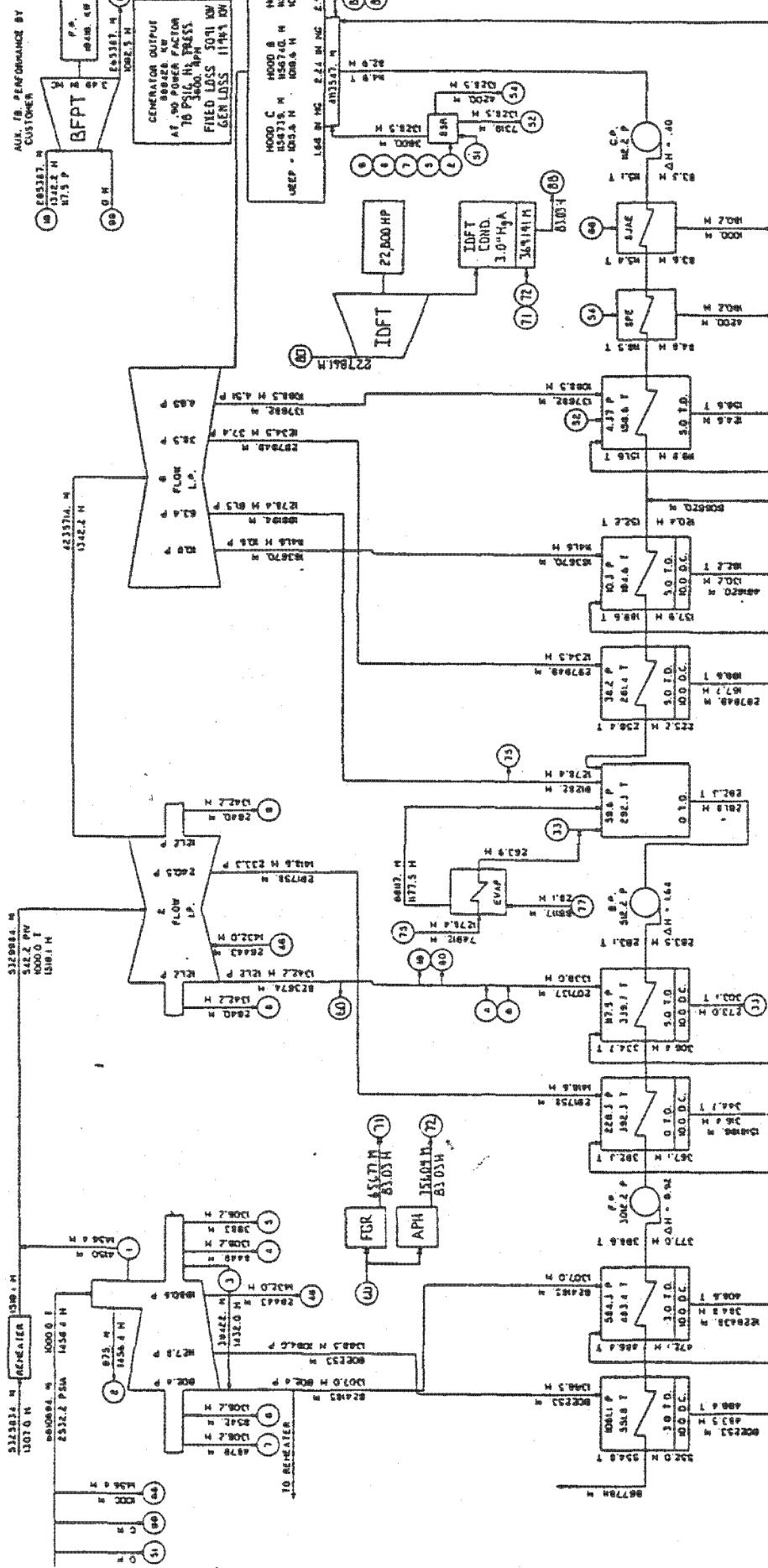
*Submittal*  
Proposal

437 HE MS

EXTRACTION ARRANGEMENT IN SCHEMATIC DAY

CALCULATED DATA - NOT GUARANTEED

BATING FLOW IS GUARANTEED TO BE 7714.4 M<sup>3</sup>/HR. AT INLET STEAM CONDITION OF 2432.2 PSIA AND 400.0 °F.  
TO ENSURE THAT THE TURBINE WILL PASS THE FLOW, CONSIDERING VARIATIONS IN FLOW COEFFICIENTS  
FROM EXPECTED VALUE, SOME TOLERANCES ON CHAMBER AREAS, ETC. WHICH MAY AFFECT THE FLOW, THE  
TURBINE IS BEING DESIGNED FOR A DESIGN FLOW RATING FLOW PLUS 5.0 PERCENT OF 62762.4 M<sup>3</sup>  
THE EQUIVALENT DESIGN FLOW AT 2332.2 PSIA AND 400.0 °F IS 6400.7 M<sup>3</sup>/HR.



LEGEND - CALCULATIONS BASED  
ON ASME STEAM TABLES  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-° DEGREES

$$\begin{aligned} \text{LMTD} &= 6610694.4 \text{ H} / (1456.4 \text{ H} + 552.0 \text{ H}) + 632543.0 \text{ H} / (1307.1 \text{ H} + 1413547.4 \text{ H}) + 4113547.4 \text{ H} / (40.40 \text{ H}) \\ \text{NET HEAT RATE} &= 6677011.4 \text{ H} / (1.64 \text{ H}) + 6611.4 \text{ H} / (1456.4 \text{ H} + 552.0 \text{ H}) + 6611.4 \text{ H} / (220.5 \text{ H} + 552.0 \text{ H}) = 8008 \text{ BTU/KWH} \end{aligned}$$

GENERAL ELECTRIC COMPANY, SCHENECTADY, N.Y.

437 HE MS

437 HE MS

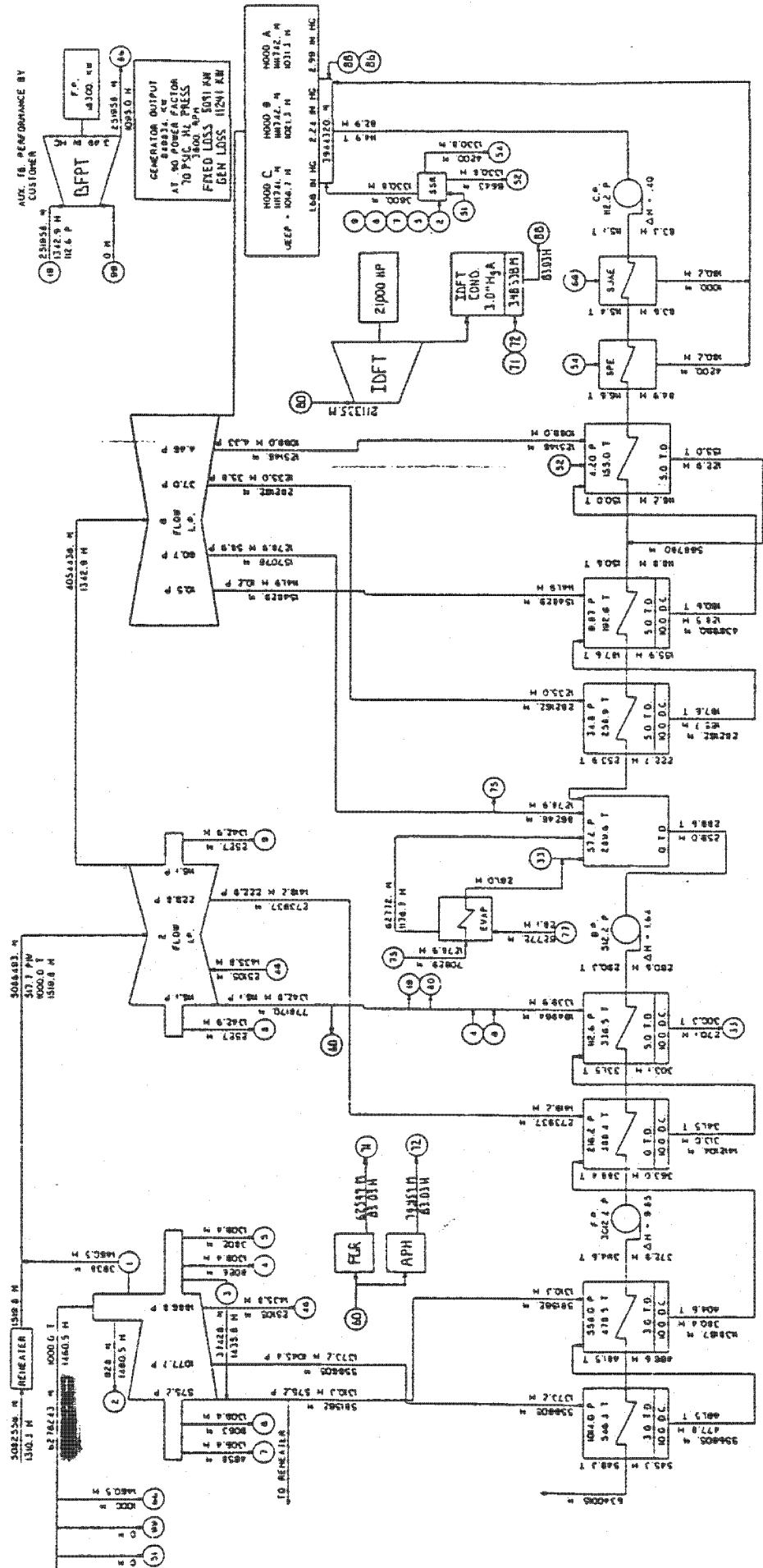
IP7010313

477 NO 466

## EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

## CALCULATED DATA - NOT GUARANTEED

RATING FLOW IS DEFINED AS 307374 M<sup>3</sup>/HR AT RET STEAM CONDITIONS OF 2426 PSIA AND 900°C T  
TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, LOWERING VARIATIONS IN FLOW COEFICIENTS  
FROM EXPECTED VALUES BY 50 PERCENTS ON DRAVE AREAS, ETC., WHICH MAY AFFECT THE FLOW. THE  
TURBINE IS BEING DESIGNED FOR A DESIGN FLOW RATE 5% ABOVE FLOW PLUS 50 PERCENT OF RATING FLOW.



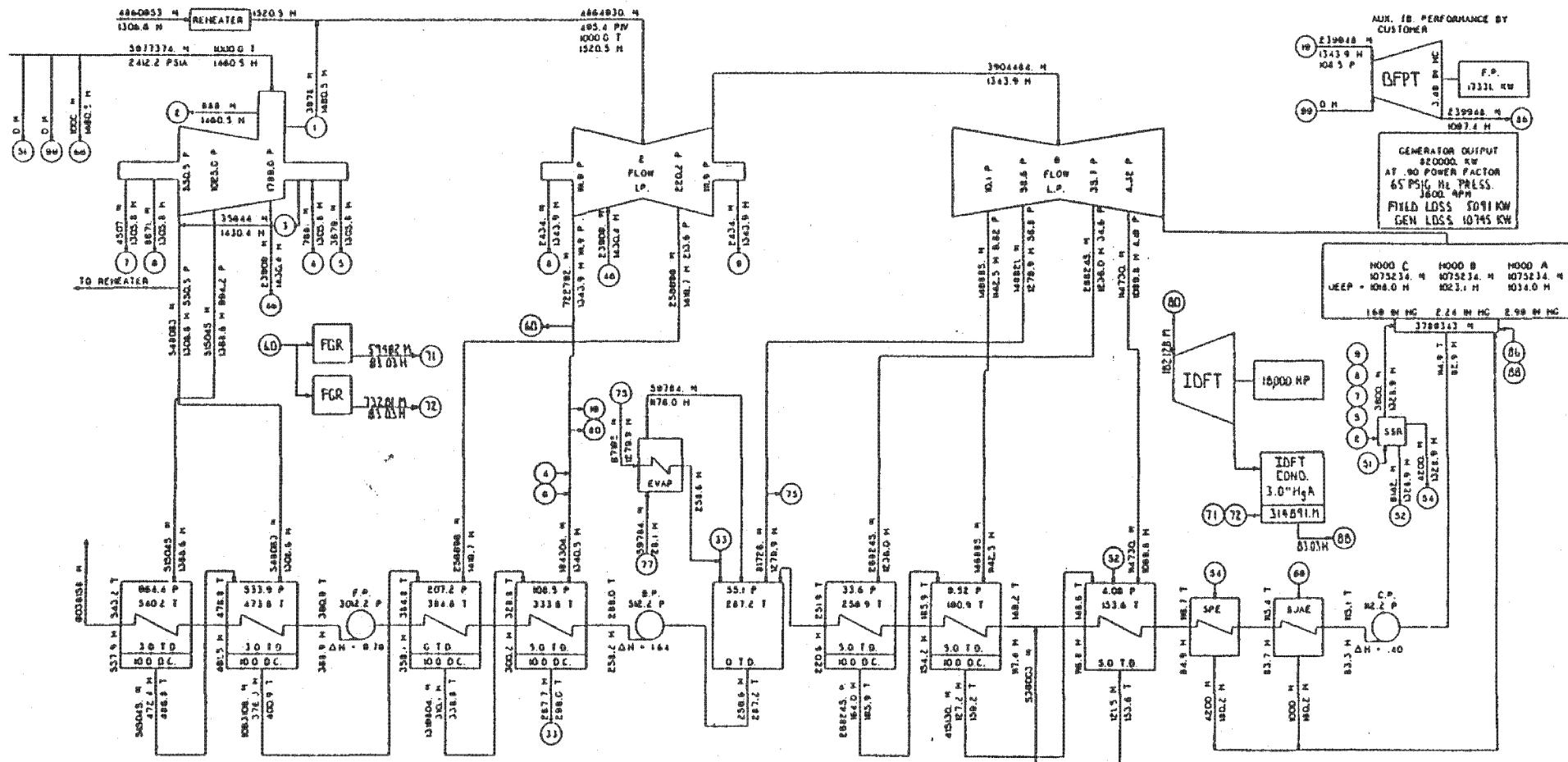
CUSTOMER DEFINED + 6276243. M (1460.5 H - 545.3H) + 5085556. M (1519.8 H - 1210.3H) + 3944320. M [0.4H] = 8028 BTU NET MEAT RATE + 46340015. M (1.64 H) + 1000. M (1460.5 H - 545.3 H) + 6276. M (120.5 H - 55.5 H)

LEGEND - CALCULATIONS BASED  
ON RET ASME STEAM TABLES  
H - FLUID-100%  
P - PRESSURE-PSIA  
E - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

*Handwritten notes:*  
Aux 1000 M<sup>3</sup>/HR 0 0 0  
377 NO 466

IP7010314

477 HB 167



620000. KW 148 / 2.24 / 2.98 IN HG ABS. 100 PCT HI  
TCF 30.0 IN LBB 3800 RPM  
2400 PSIG 1000 / 1000 T  
GEN-988400. KVA .90 PF LO

*Hew Korea*

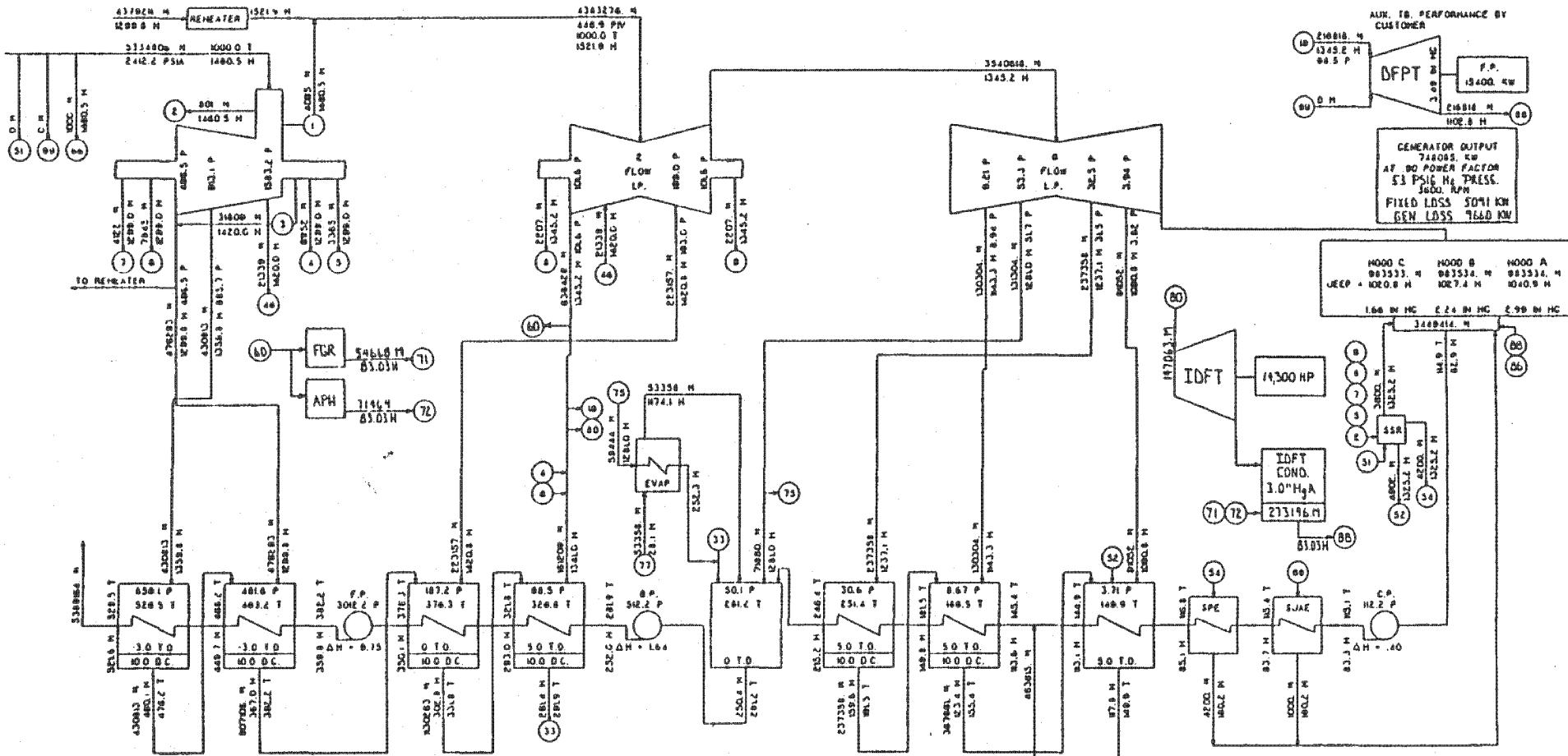
3844H + 060201 0523 8 3  
477 HB 167

7-8-80

IP7010315

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

477 MB 166

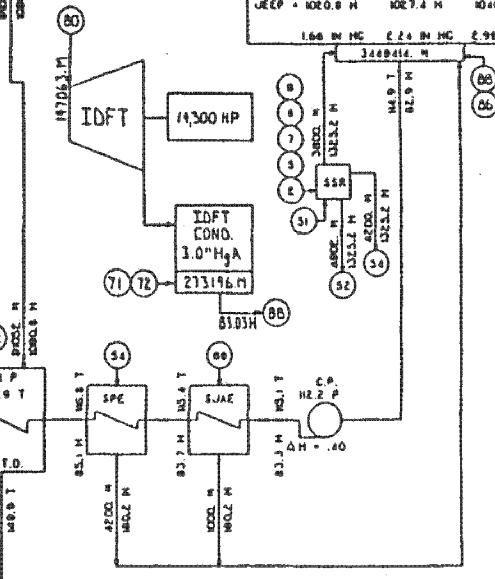


EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

AUX. TB. PERFORMANCE BY CUSTOMER

GENERATOR OUTPUT  
748085. KW  
AT 80 POWER FACTOR  
53 PSIG海压 PRESS.  
3000 RPM  
FIXED LOSS 5041 KW  
GEN LOSS 7660 KW

HOOD C 983533. H HOOD B 983534. H HOOD A 983535. H  
JEEP + 800.0 H 166 IN HC 1.24 IN HC 0.98 IN HC



LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
H - FLOW-LB/HR  
P - PRESSURE-PSIA  
W - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

820000. KW 1.66 / 2.24 / 0.98 IN HC ABS. 100 PCT HI  
TCBF 300.0 M. LBB 3800 APH  
2400 PSIG 1000. / 1000. T  
GEN 988400. KVA 90 PF LO

CUSTOMER DEFINED  
NET HEAT RATE =  $5334806. H (1460.5 H - 521.6 H) + 4379211. H (1521.9 H - 1299.8 H) + 3449414. H (0.40 H)$   
 $= 45389164. H (1.64 H) + 1000. H (1460.5 H - 521.6 H) + 5335. H (720.5 H - 521.6 H)$  = 8012 BTU/KW-HR

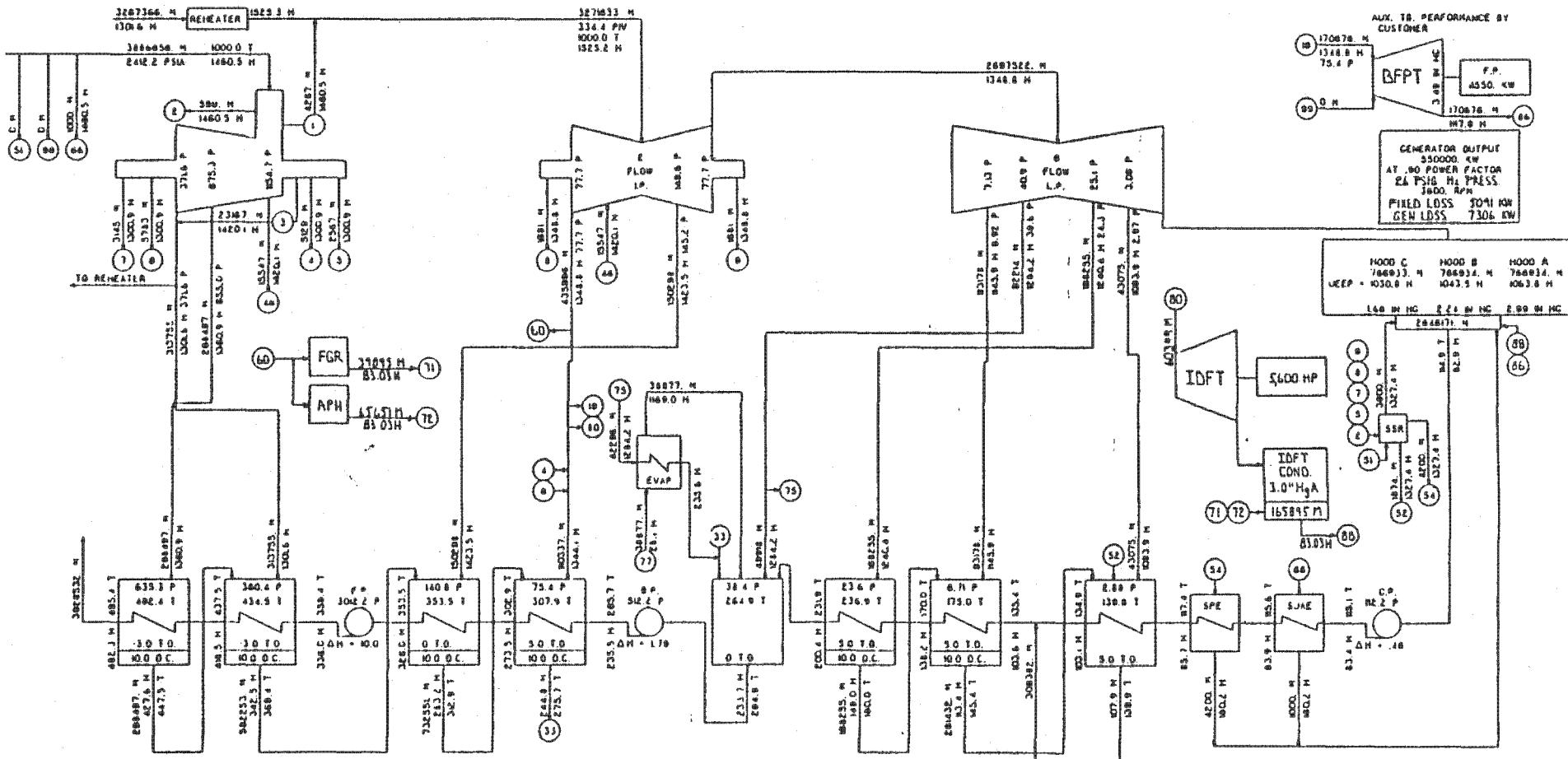
GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

3844H 1 0802W 8500 0.10  
477 MB 166 7-N-80

IP7010316

IP7010317

477 HB 168

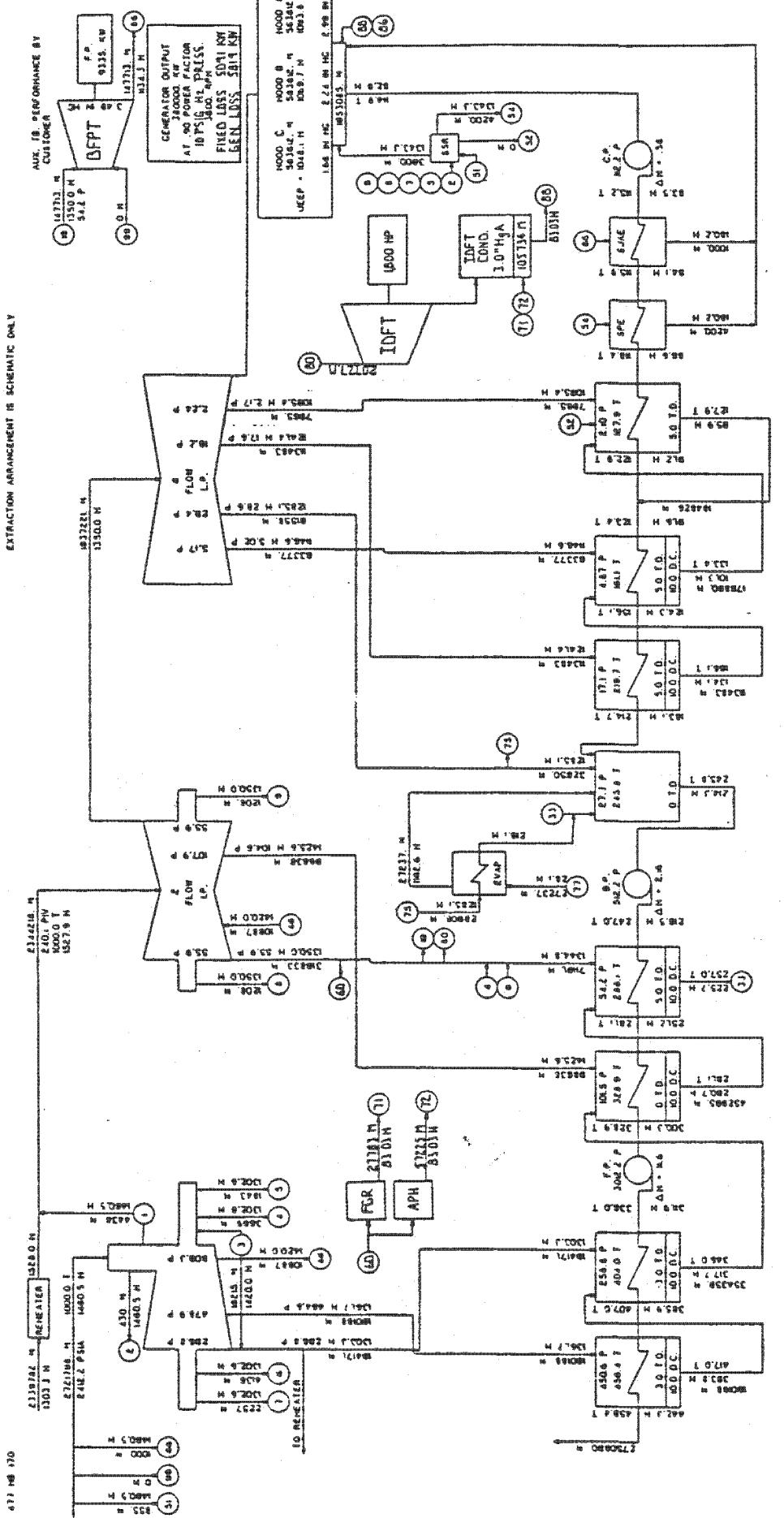


CUSTOMER DEFINED  
NET HEAT RATE =  $3806656. \text{H} (1460.5 \text{ H} - 482.3 \text{ H}) + 3267366. \text{H} (1525.3 \text{ H} - 1301.6 \text{ H}) + 2646171. \text{H} (0.46 \text{ H}) = 8260 \text{ BTU}$   
550000. KW

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

820000. KW 1.66 / 2.24 / 2.99 IN HG ABS. 100 PCT HI  
TCAP 30.0 IN LSP 3600 APM  
2400 PSIG 1000. / 1000. T  
CEN-881400. KVA .90 PF LIQ

3644H 1 DB0201 6102 0 H  
477 HB 168  
7-8-80



87000. KW 1460 / 224 / 600 IN MC ABS. 100 PCT HD  
1000 H.P. 1600 RPM  
2100 PCT 1000 / 1000 /  
GEN 90000. KW 90 PCT LD

Mark  
36401-Draft 4120 0.45 1-HR 170

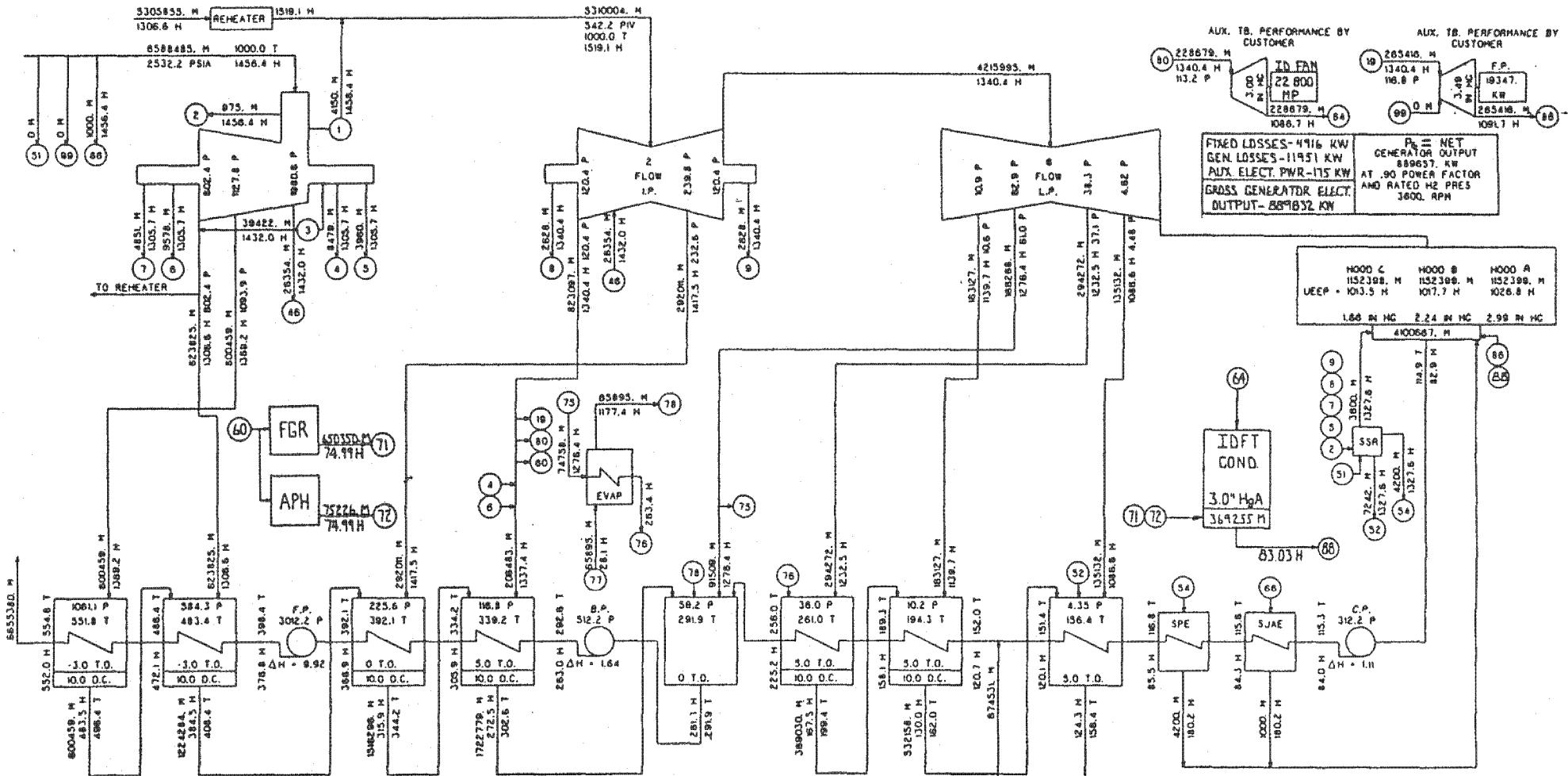
IP7010318

*Submittal II  
PROPOSAL  
REV.*

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

CALCULATED DATA - NOT GUARANTEED

RATING FLOW IS 5957292. M<sup>3</sup> AT INLET STEAM CONDITIONS OF 2412.2 PSIA AND 1000.0 T. TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, CONSIDERING VARIATIONS IN FLOW COEFFICIENTS FROM EXPECTED VALUES, SHOP TOLERANCES ON DRAWING AREAS, ETC. WHICH MAY AFFECT THE FLOW, THE TURBINE IS BEING DESIGNED FOR A DESIGN FLOW (RATING FLOW PLUS 5.0 PERCENT) OF 6235157. M<sup>3</sup>. THE EQUIVALENT DESIGN FLOW AT 2332.2 PSIA AND 1000.0 T IS 6388485. M<sup>3</sup>.



CUSTOMER DEFINED  
VALVE BEST POINT  
NET HEAT RATE

$$= 6588485. M(1456.4H - 552.0H) + 5305855. M(1519.1H - 1306.6H) + 4100667. M(1.11H) \\ = 6655380. M(1.64H) + 1000. M(1456.4H - 552.0H) + 6586. M(720.5H - 552.0H)$$

$$= 7985 \text{ BTU} \\ \text{KW-HR}$$

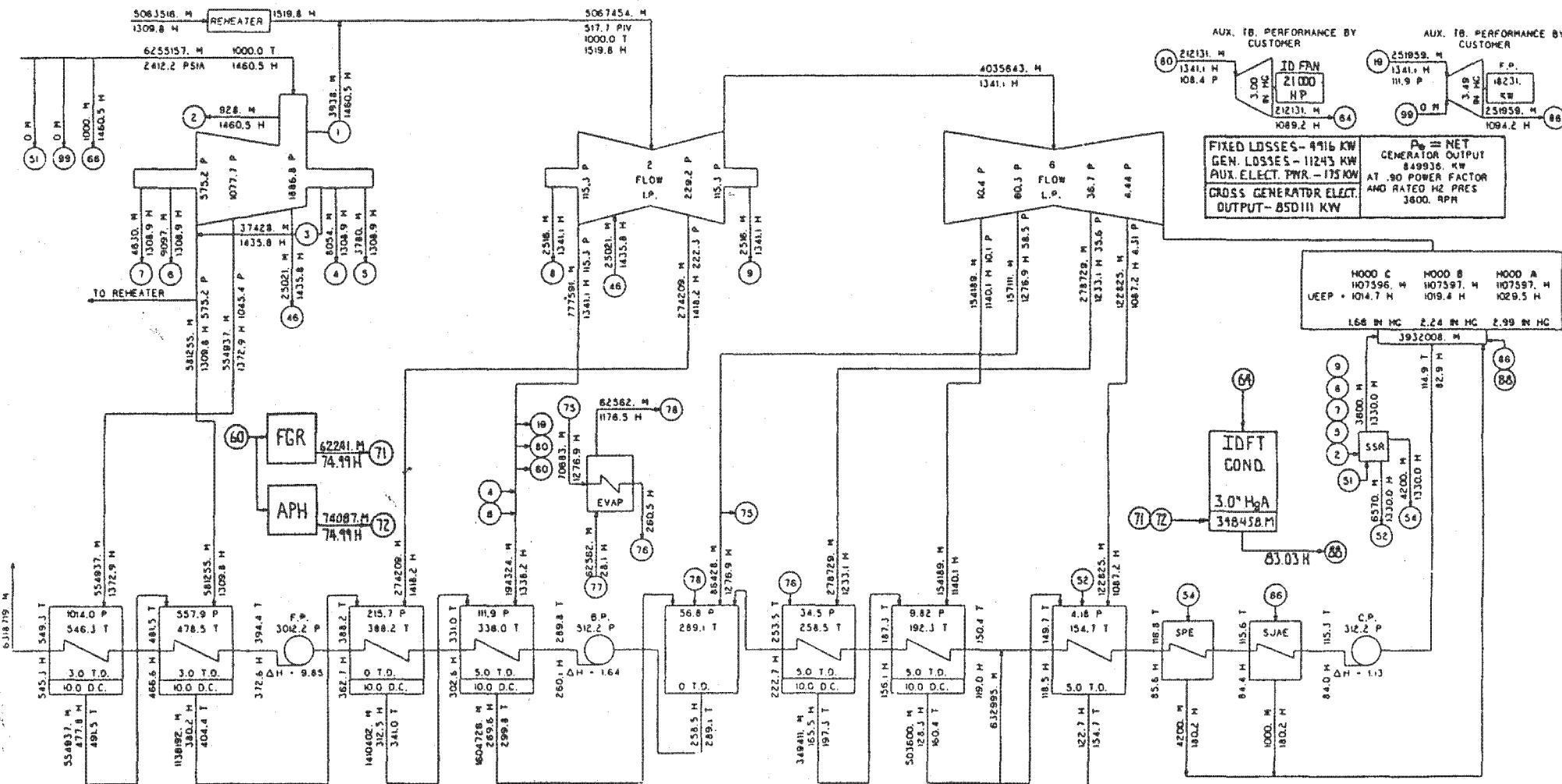
LEGEND - CALCULATIONS BASED  
ON 1987 ASME STEAM TABLES  
M - FLOW-LB/MIN  
P - PRESSURE-PSIA  
T - ENTHALPY-BTU/LB  
F - TEMPERATURE-F DEGREES

820000. KW 168 / 2.24 / 2.99 IN HC ABS. 1.00 PCT MU  
TCBF 30.0 IN. L586 3600 RPM  
2400 PSID 1000. / 1000. T  
GEN- 988400. KW .90 PF LIQ

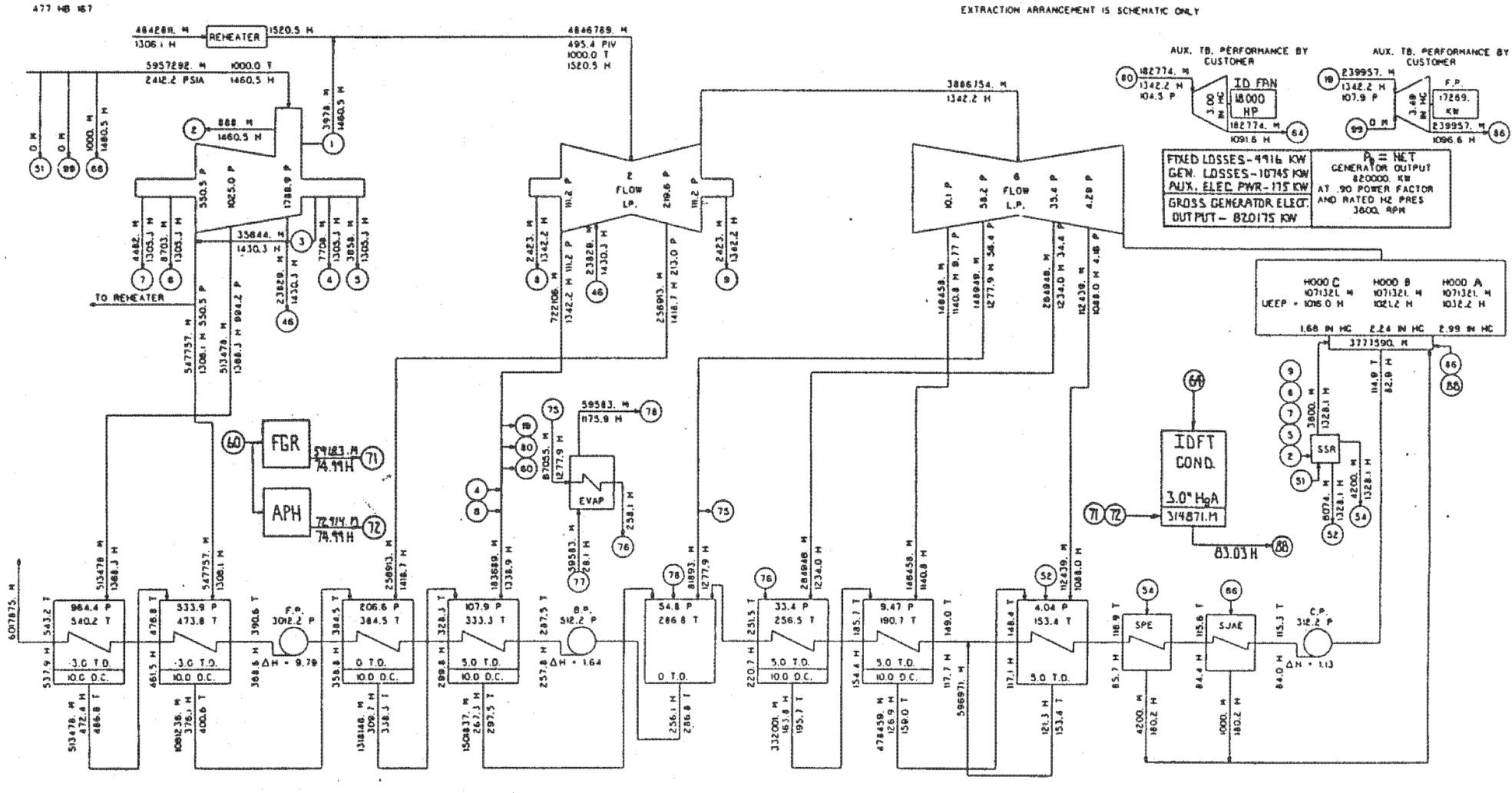
EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

CALCULATED DATA - NOT GUARANTEED

RATING FLOW IS 5857292. M<sup>3</sup>/HR AT INLET STEAM CONDITIONS OF 2412.2 PSIA AND 1000.0 T. TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, CONSIDER VARIATIONS IN FLOW COEFFICIENTS FROM EXPECTED VALUES, SHOP TOLERANCES ON DRAWING AREAS, ETC., WHICH MAY AFFECT THE FLOW. THE TURBINE IS BEING DESIGNED FOR A DESIGN FLOW# RATING FLOW PLUS 5.0 PERCENT OF 6255157. M<sup>3</sup>/HR.



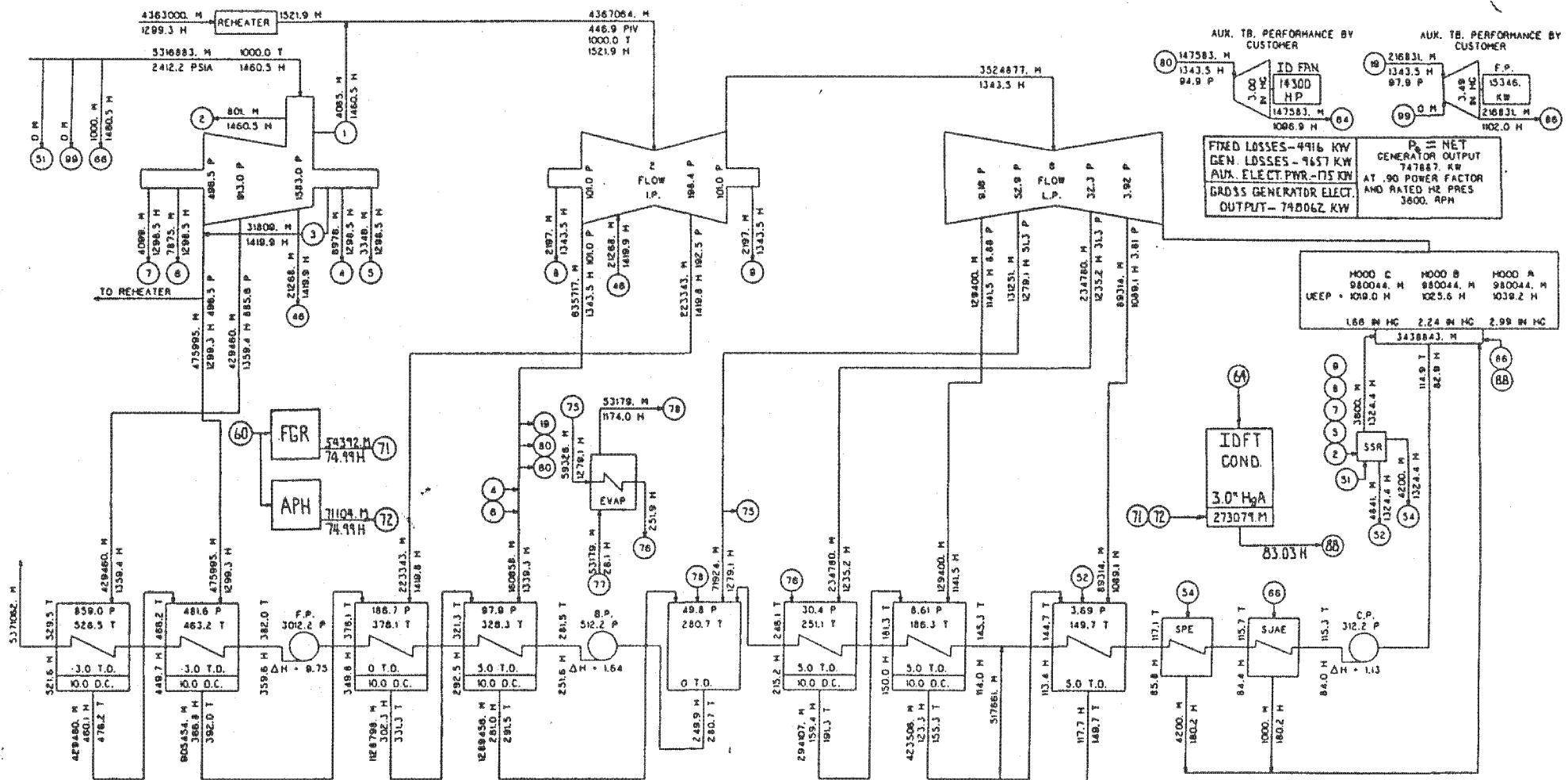
EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



**820000. KW 1.68 / 2.24 / 2.99 IN HG ABS. 100 PCT MU**  
**TCSF 30.0 FT. LSF 3600 RPM**  
**2400 PSIG 1000. / 1000. T**  
**GEN 988400. KVA .90 PF LIO**

*Kew Kew*  
 383BM 100291 0523  
 477 HB 167 D 3 REVISED 9-16-80  
 7-11-80

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



CUSTOMER DEFINED  
VALVE BEST POINT  
NET HEAT RATE

$$= 5316883. M(1460.5H - 521.6H) + 4363000. M(1521.9H - 1299.3H) + 3438843. M(1.13H) + 5317062. M(1.64H) + 1000. M(1460.5H - 521.6H) + 5317. M(720.5H - 521.6H)$$

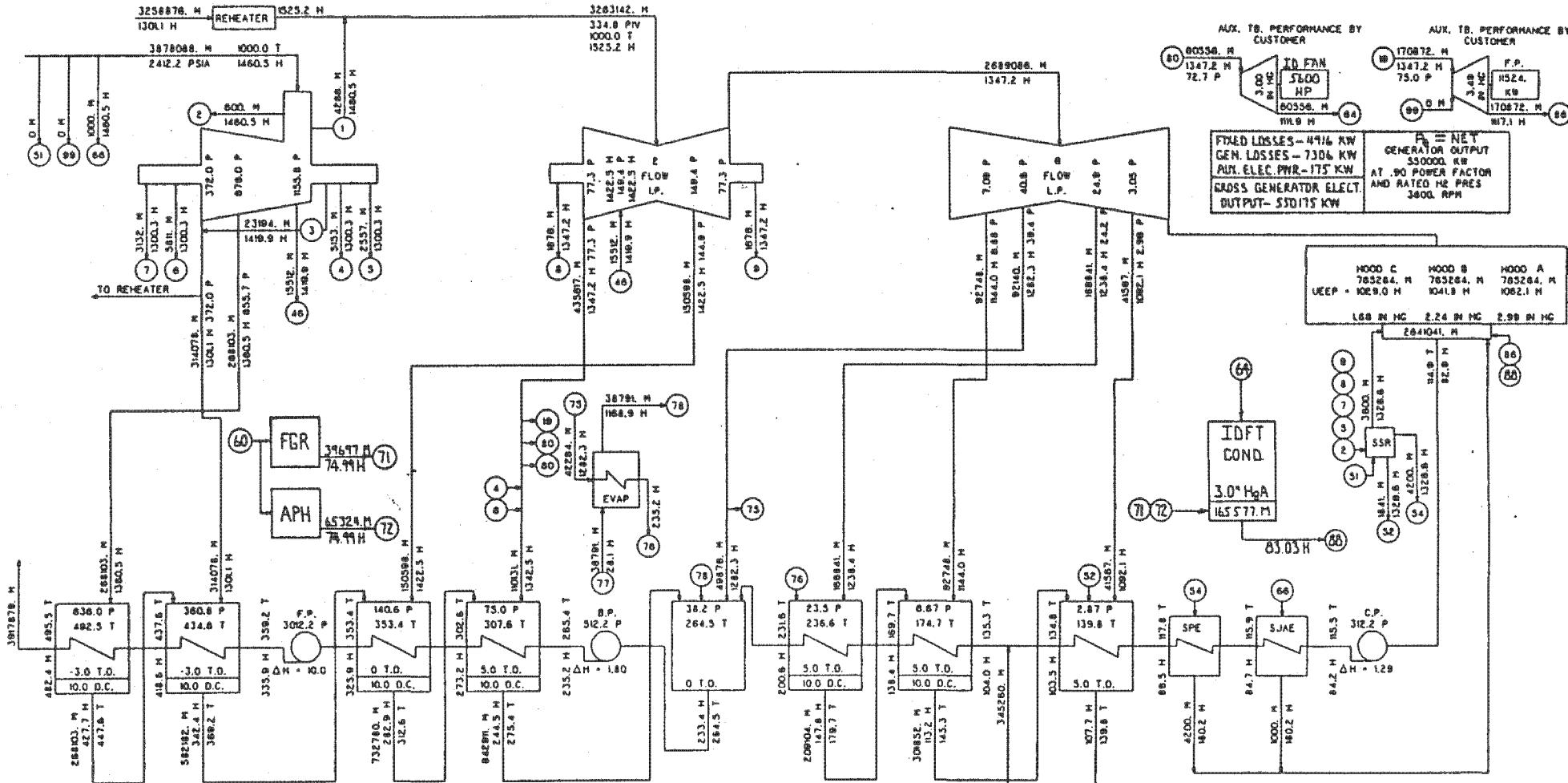
747887 KW

\* 7993 BTU  
KWH-IR

LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
H - FLOW-LB/H  
P - PRESSURE-PSIA  
M - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

820000. KW 1.66 / 2.24 / 2.99 IN HG ABS. 1.00 PCT MU  
TCOF 30.0 IN. LSB 3600 RPM  
2400 PSIG 1000. / 1000. I  
GEN- 888400. KVA .90 PF LIO

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



CUSTOMER DEFINED  
VALVE BEST POINT =  $3878088.M(1460.5H - 482.4H) + 3258876.M(1525.2H - 1301.1H) + 2641041.M(1.29H)$   
NET HEAT RATE =  $+3917879.M(1.80H) + 1000.M(1460.5H - 482.4H) - 3878.M(720.5H - 482.4H)$

8247 BTU  
KM-HR

LEGEND - CALCULATIONS BASED  
ON 1067 ASME STEAM TABLES  
M - FLOW-LB/MIN  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

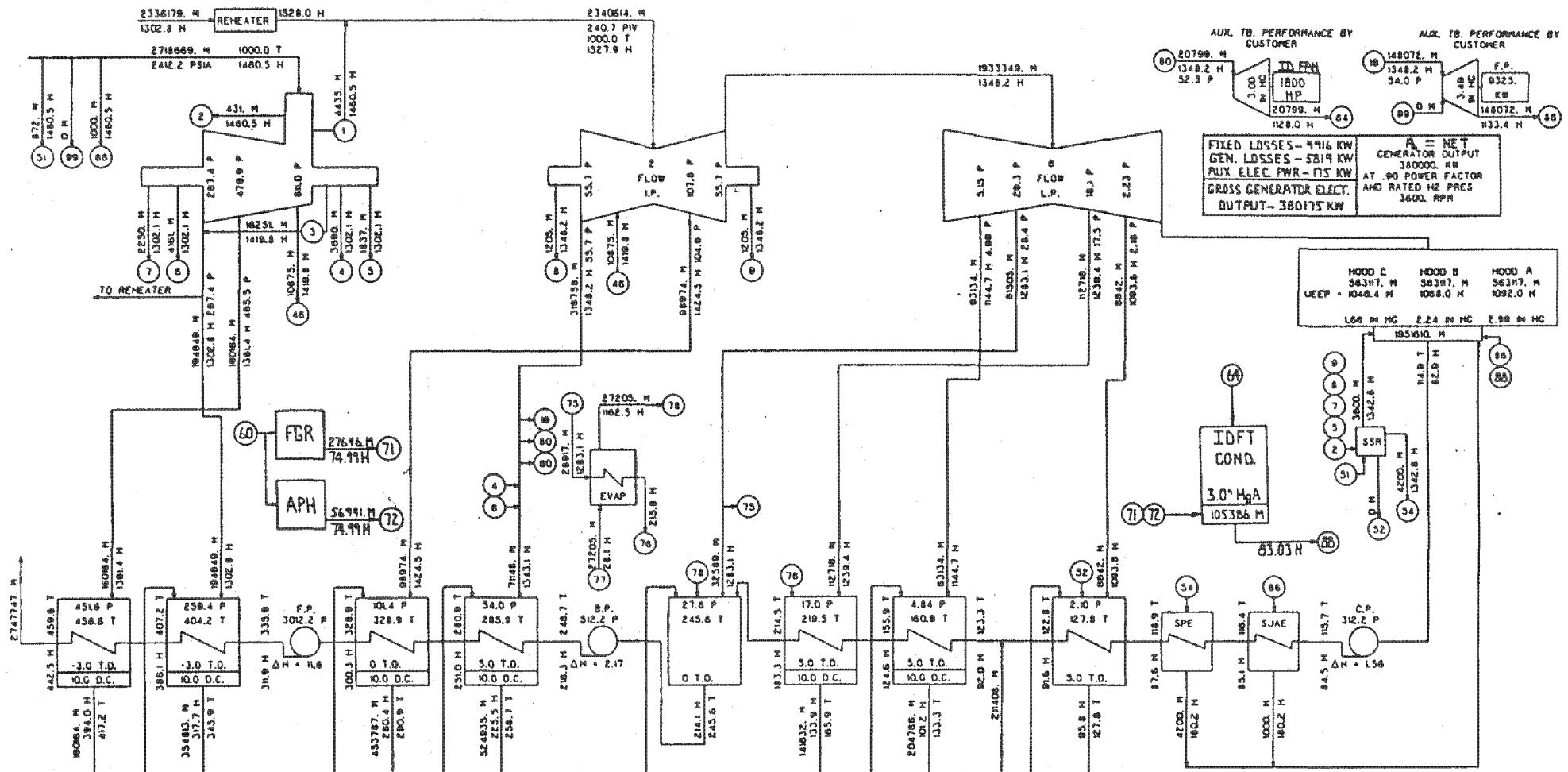
820000. KW 168 / 2.24 / 2.98 IN HG ABS. 1.00 PCT MU  
TCAP 30.0 IN. LSS 3800 RPM  
2400 PSIG. 1000. / 1000. T  
GEN 988400. KVA .90 PF LIQ

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

KW Rolen  
3638M 1 080281 8168 0 110 477 HB 168 REVISED 9-16-80  
7-11-80

477 HD 170

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



CUSTOMER DEFINED  
VALVE BEST POINT =  $2718669. M(1460.5H-442.5H)+2336179. M(1528.0H-1302.8H)+1951610. M(1.56H)$   
NET HEAT RATE =  $\approx +2747747. M(2.17H)+1000. M(1460.5H-442.5H)+2719. M(720.5H-442.5H)$

= 8696 BTU  
KWH-HR

LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
H = FLOW-LB/HR  
P = PRESSURE-PSIA  
H = ENTHALPY-BTU/LB  
T = TEMPERATURE-F DEGREES

820000. KW 1.68 / 2.24 / 2.99 IN HG ABS. 100 PCT MU  
TCBF 30.0 IN. LSB 3600 RPM  
2400 PSIG 1000. / 1000. T  
GEN- 988400. KVA .90 PF LIO

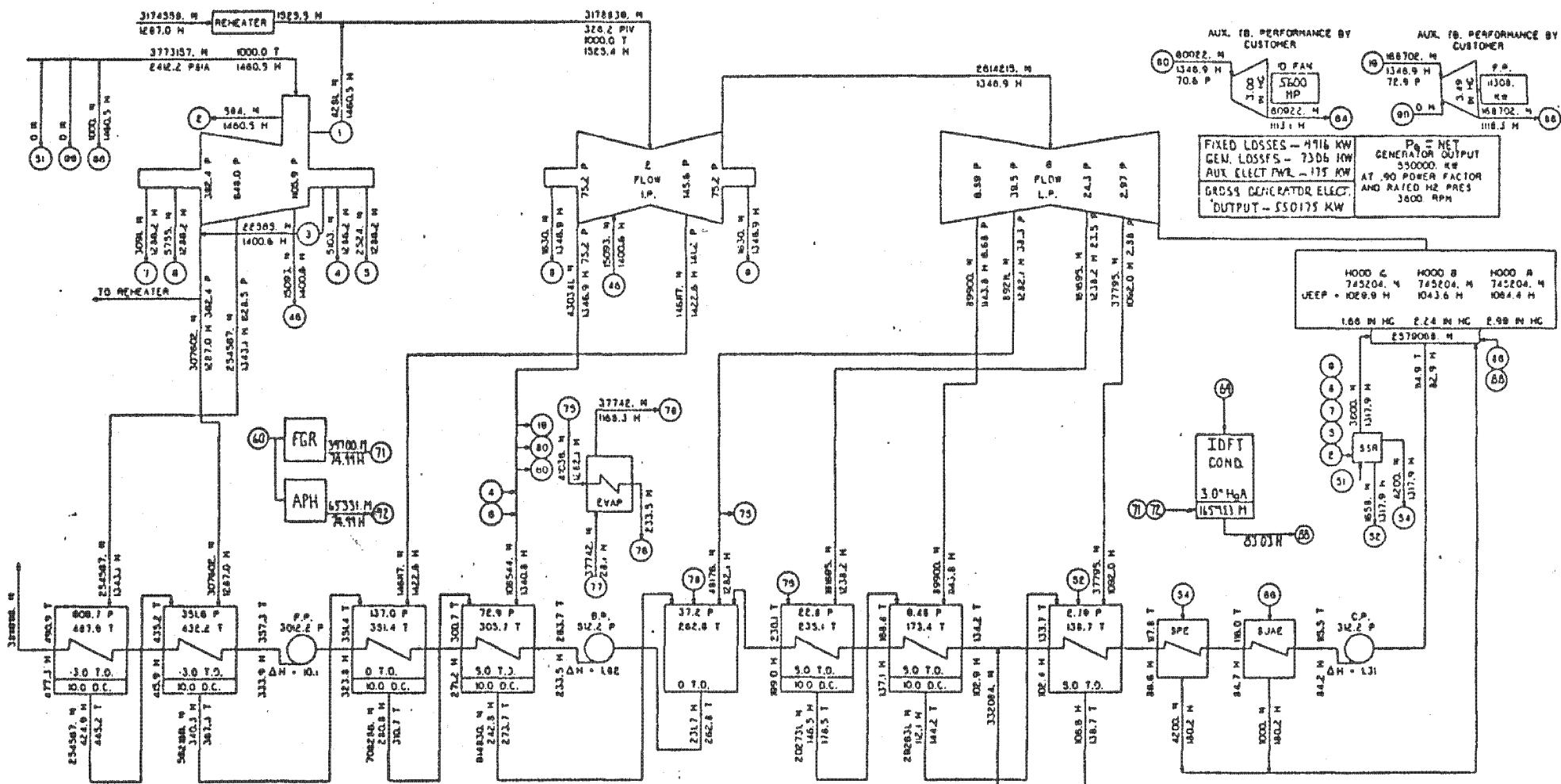
GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

3838H 1 080291 4346 0 12 REVISED 9-16-80  
477 HD 170 7-11-80

IP7010324

677 MB 384

## EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



CUSTOMER DEFINED  $3773157.M(1460.5H-477.3H)+3174558.M(1525.5H-1287.0H)+2579068.M(1.31H)$   
 VALVE BEST POINT =  $3811898.M(1.82H)+1000.M(1460.5H-477.3H)+3773.M(20.5H-477.3H)$   
 NET HEAT RATE = 550,000 KW

= 8144 STU  
KW-HR

LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
M - FLOW-LB/HR  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

620000, K# 1.68 / 2.24 / 2.96 IN HG ABS. 100 PCT HS  
TCF 300 IN LBB 3600 RPM  
Z400 PSIG 1000. / 1000. T  
GEN- 988400 RVA .90 PF L10

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

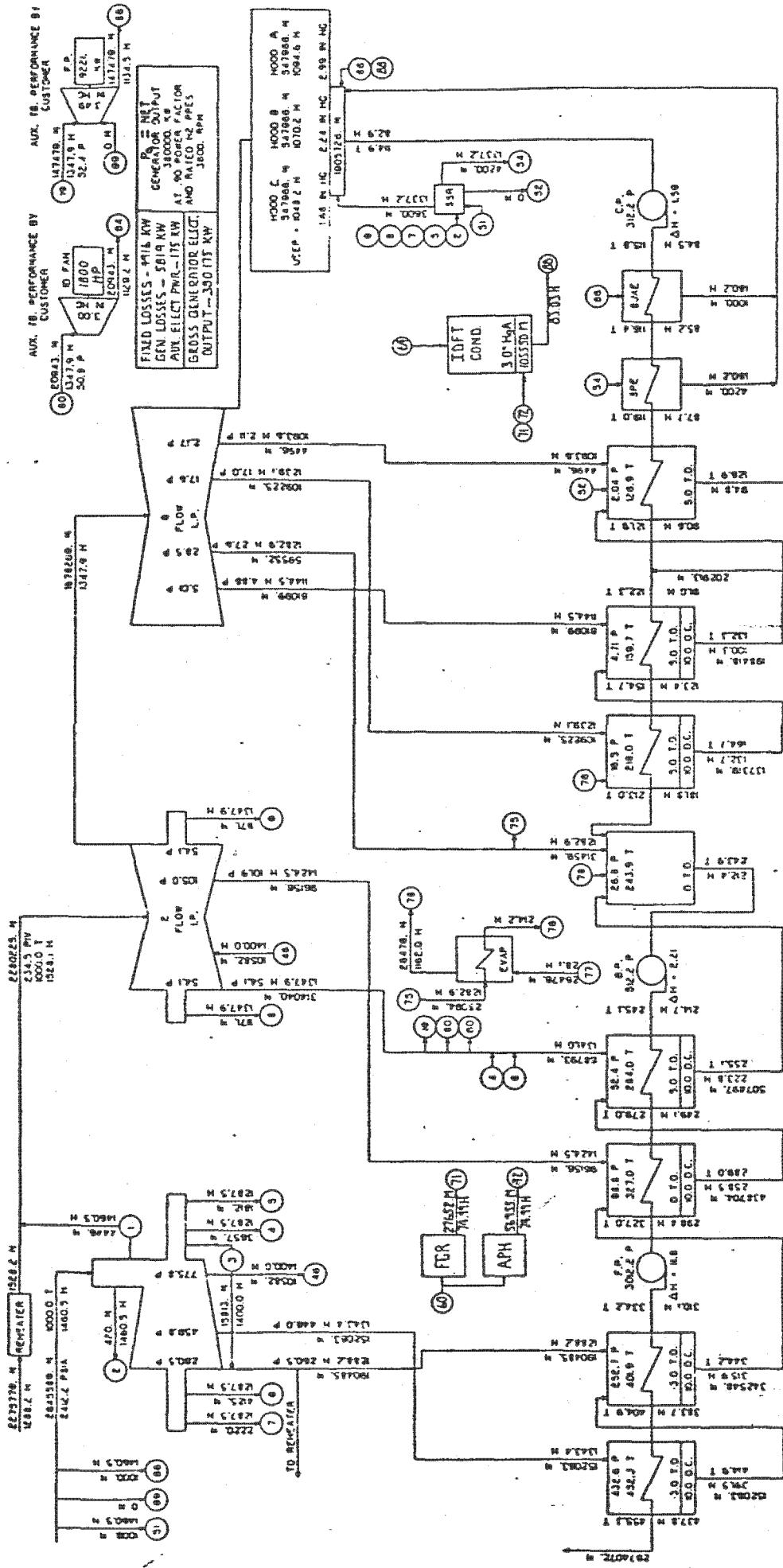
5915C 1 000261 0032 Q H  
677 MB 384

10-15-80

IP7010325

477-HB-366

EXTRACTION ARRANGEMENT II SCHEMATIC ONLY



CUSTOMER DEFINED  
VALVE SET POINT = 2845589 M(1460.5H-437.8H)+2275779 M(1528.2H-1288.2H)+1905726 M(1.59H)  
RET HEAT RATE = 380.000 KWH

B586 RTU  
KTH-K

**LEGEND - CALCULATIONS BASED ON 1907 ASME STEAM TABLES**

- M = FLUID MASS
- P = PRESSURE PSIA
- E = ENTHALPY BTU/LB
- T = TEMPERATURE DEGREES F

GENERAL ELECTRIC COMPANY, ALEXANDRIA, VA

20351 DCE0614240 0 12

10-19-95

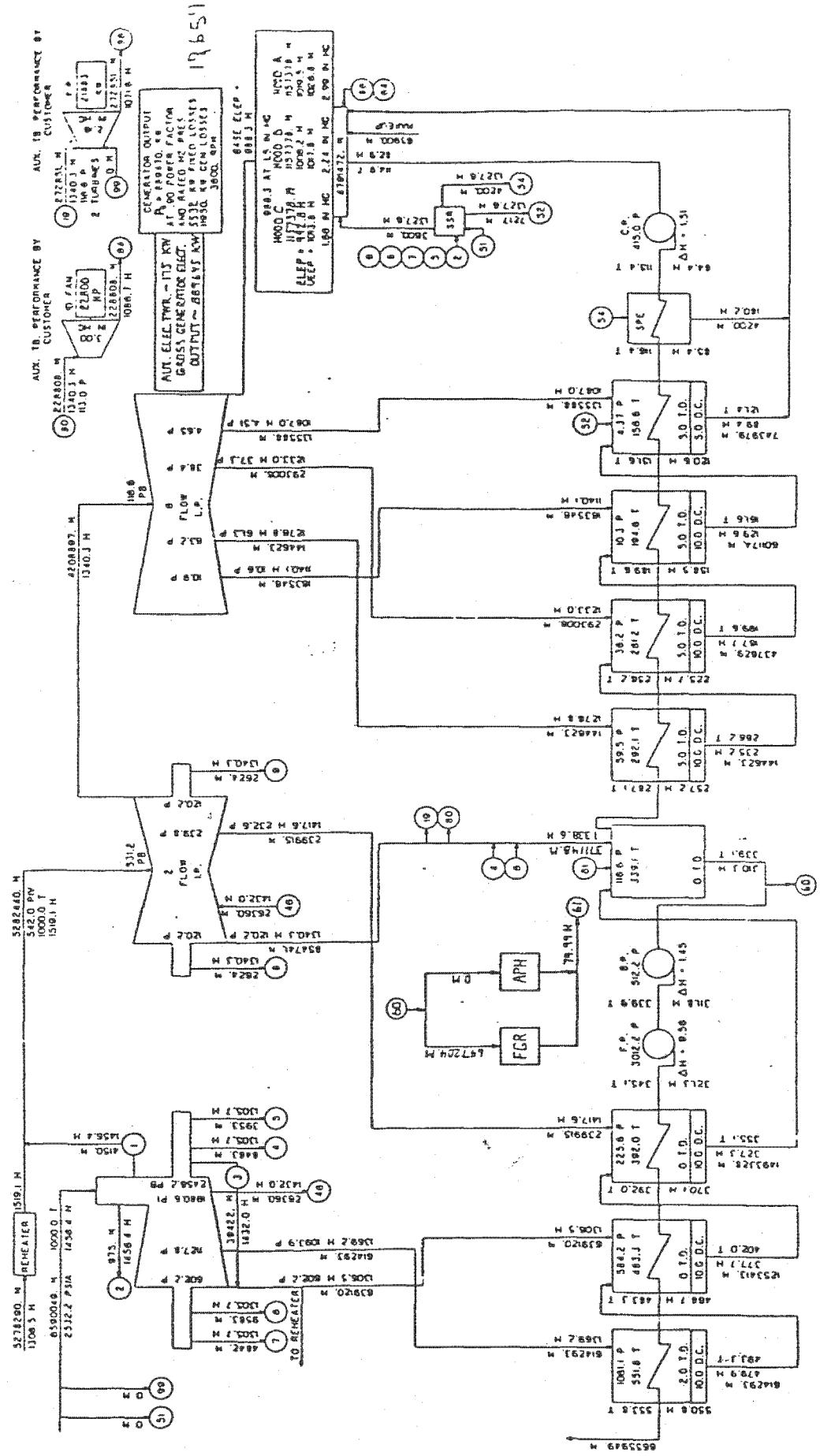
IP7010326

INITIAL  
SUBMITTED.  
AWARDED.

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

CALCULATED DATA - NOT GUARANTEED

RATING FLOW IS 589807, M<sup>3</sup>/HR. AT FULL STEAM CONDITIONS OF 542.0 PSIA AND 1000.0 °C, TO ASSURE THAT THE TURBINE WILL PASS 1450 FL/O, CONDENSATE VARIATIONS OR DROPOFFS FROM EXPECTED VALUES, SHOT TORQUES ON DRAGGING ARMS, ETC., WHICH MAY AFFECT THE STEAM TURBINE, IS HENCE DESIGNED FOR A DESIGN FLOW (RATING FLOW PLUS 5.0 PERCENT) OF 613000. M<sup>3</sup>/HR. THE EQUIVALENT DESIGN FLOW AT 2532.2 PSIA AND 1000.0 °C IS 658000. M<sup>3</sup>/HR.



CUSTOMER DEFINED  
VALVE BEST POINT = 658000. M<sup>3</sup>/HR. / 542.0 PSIA / 1000 °C  
NET HEAT RATE = 46590. M<sup>3</sup>/HR. / 542.0 PSIA / 1000 °C

6590049. M(1456.4H + 550. BH) + 5578290. M(1519.1H - 1306.5H) + 47191472. M(1.5H)

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.  
IP7010327

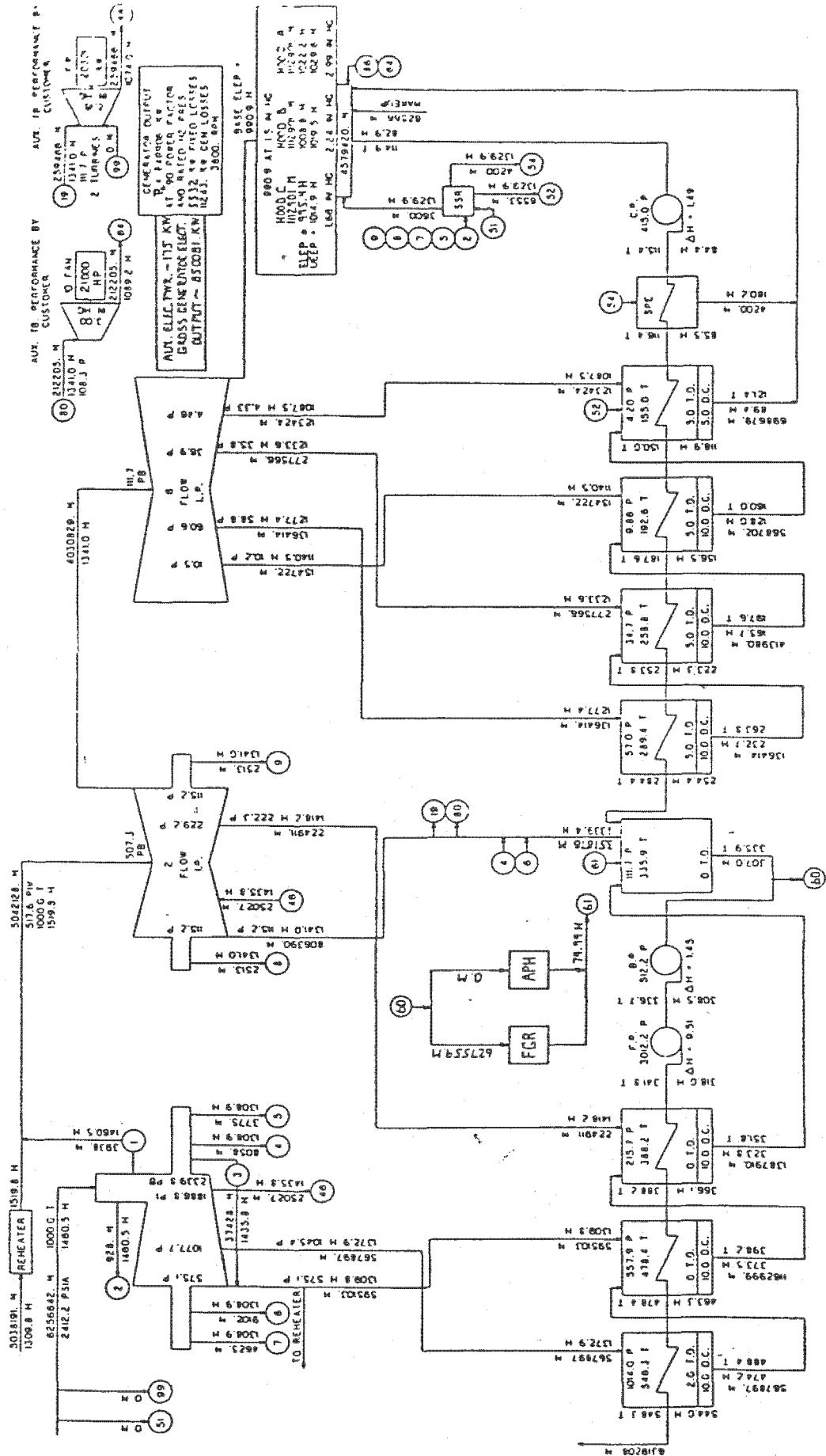
LEGEND : CALCULATIONS BASED  
ON 1961 - ASME STEAM TABLES  
H = HEAT 1-BAR  
P = PRESSURE BAR  
K = INITIAL P. BTU/LB  
T = TEMPERATURE °F DEGREES

620000. K°  
1456.4H / 244 / 2.00 MHC 183. 190 PC 148  
1456.4H 158 1800 RPM  
24400.0S16 1000. 14000 RPM  
GEN 616800. KVA .50 PF LO

KW Power Revised 1/29/61  
21071880281 0 0.13 Actual 1-18-61

EXTRACTIVE ARRANGEMENT IS SCHEMATIC ONLY

CALCULATED DATA - NOT GUARANTEED  
 RATING FLOW IS 395807 M<sup>3</sup>/HR AT MAX STEAM CONDITIONS OF 262.5 PSIA AND 1000°F.  
 TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, CONTRACTING VARIANCES FROM EXPECTED VALUES SHOULD BE TOLERANCES ON DESIGN AREAS. THE DESIGN FLOW IS BEING DESIGNED FOR A DESIGN FLOW (RATING FLOW PLUS 50 PERCENT) OF 83000 M<sup>3</sup>/HR.



LEGEND - CALCULATIONS BASIS  
 04 1519.6 H - MAX STEAM TABLES  
 P - FLOW LB/HR  
 H - PRESSURE PSIA  
 S - ENTHALPY BTU/LB  
 T - TEMPERATURE DEGREES

• STU 8001 KWH  
 • 83000 KW  
 • 83000 HRS  
 • 830000000000 J  
 • 625642 H(1460.5H-544.0H)5038191 H(1519.6H-1309.0H)+4579420 H(1.49H)  
 • 6257 H(720.5H-544.0H)

CUSTOMER DEFINED  
 VALVE BEST POINT  
 NET HEAT RATE

GENERAL ELECTRIC COMPANY, SCHENECTADY N.Y.

2000 HDB291 0 0.0000 0.0000

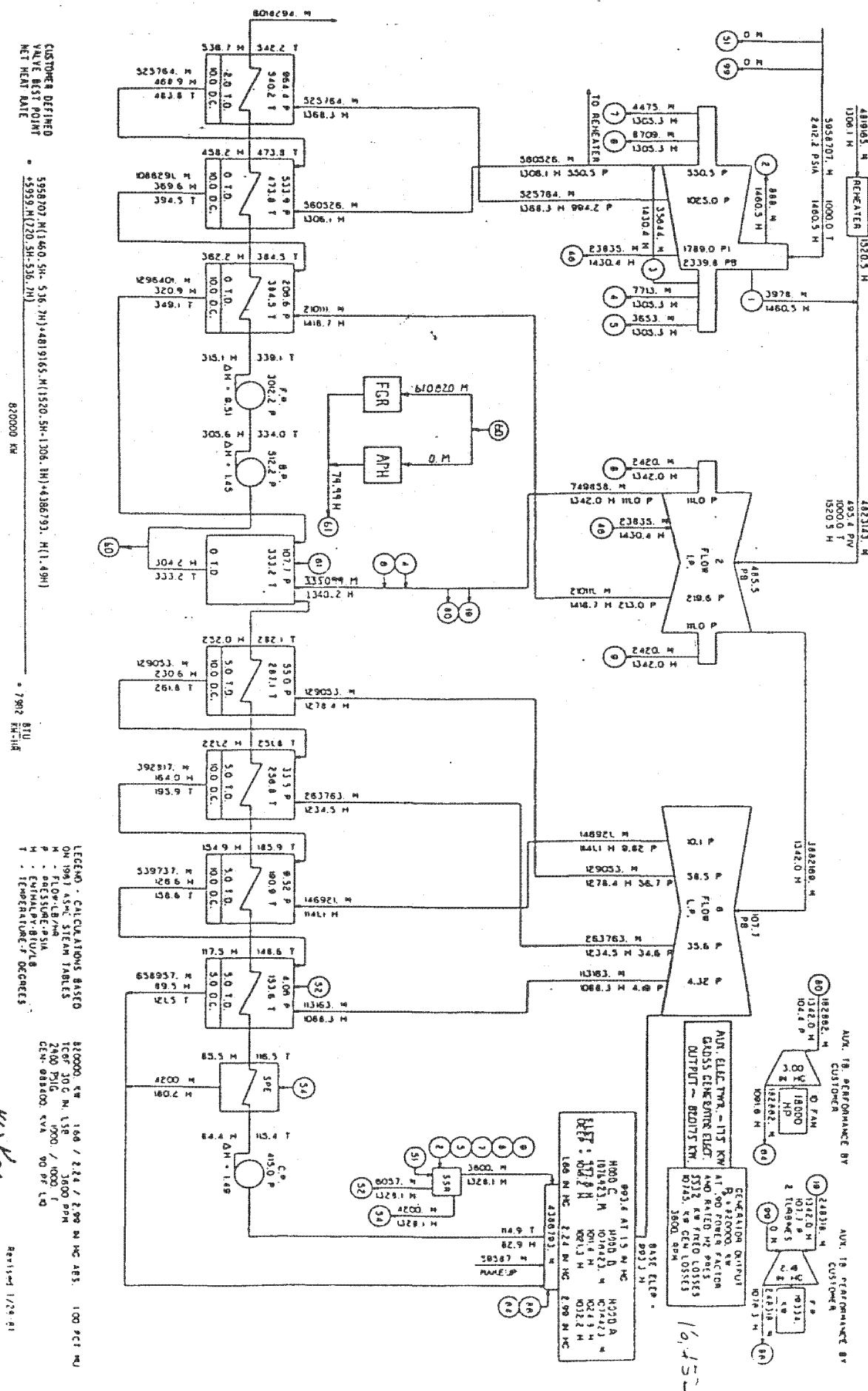
KW/Hr  
 Revised 1/13/55

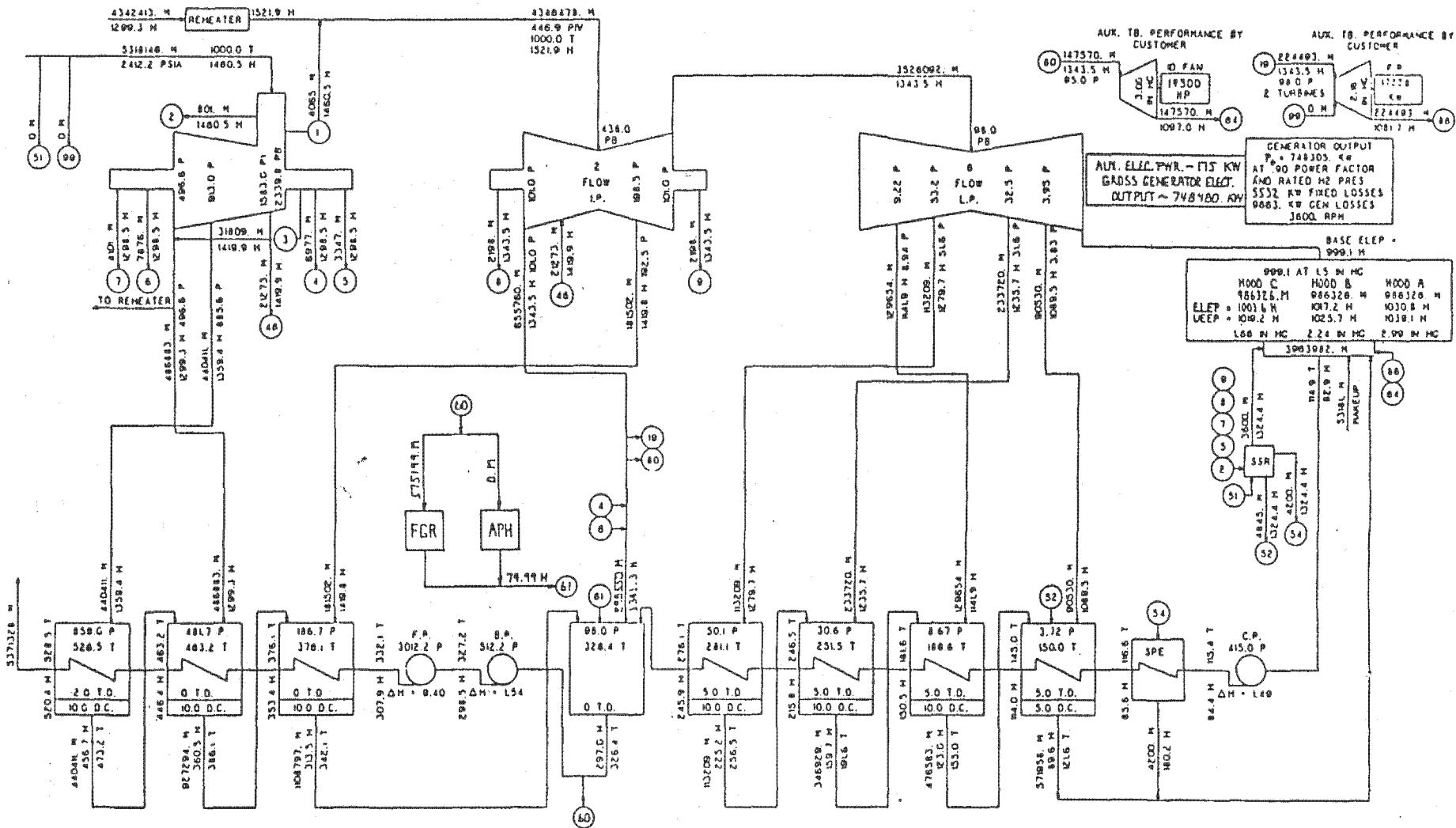
IP7010328

P7010329

478 MB 482

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY





CUSTOMER DEFINED  
VALVE BEST POINT = 5318146.M(1460.5H-520.4H)+4342413.M(1521.9H-1299.3H)+3963982.M(1.49H)  
NET HEAT RATE = +5318.M(220.5H-520.4H)

748,305 BTU

7982 BTU  
HR-10

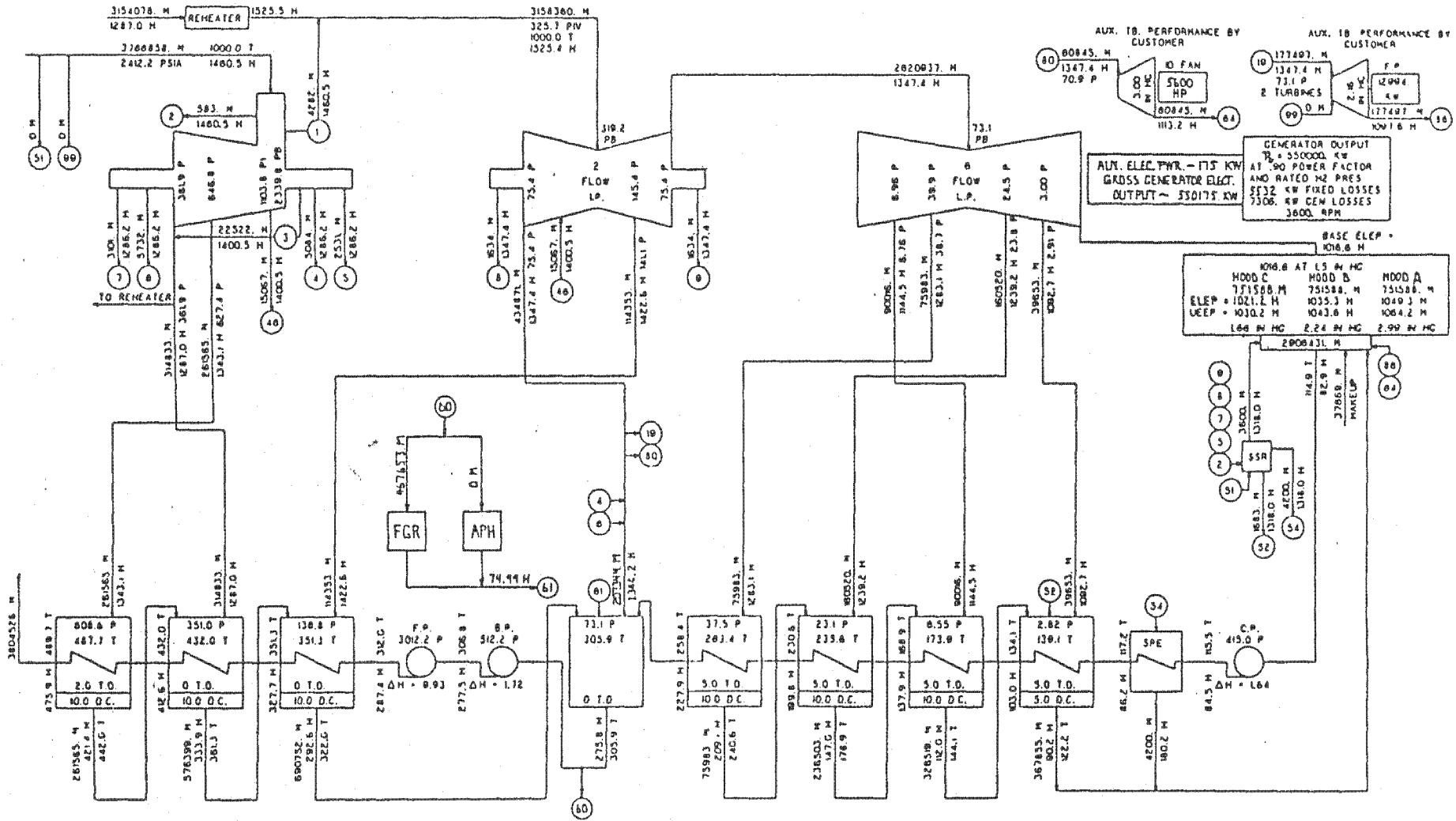
LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
H - FLOW-LB/HR  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-F DEGREES

820000 KW 166 / 2.24 / 2.99 IN HG ABS. 100 PCT MU  
TC6F 30.0 IN LSB 3600 RPM  
2400 PSIG 1000 / 1000 T  
GEN-988400 KVA .90 PF LIO

Revised 1/28/81

478 MB 464

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



CUSTOMER DEFINED  
VALVE BEST POINT = 3766858.M(1460.5H-475.5H)+3154078.M(1525.5H-1287.0H)+2906431.M(1.64H)  
NET HEAT RATE = 3767.M(770.5H-475.5H)

350000 KW

LEGEND: CALCULATIONS BASED ON 1987 ASME STEAM TABLES  
1. FLOW-LB/MIN  
2. PRESSURE-PSIA  
3. ENTHALPY-BTU/LB  
4. TEMPERATURE-F DEGREES

820000. KW 166 / 2.24 / 2.99 IN HG ABS. 100 PCT MU  
TCF 30.0 M. LSB 3600 RPM

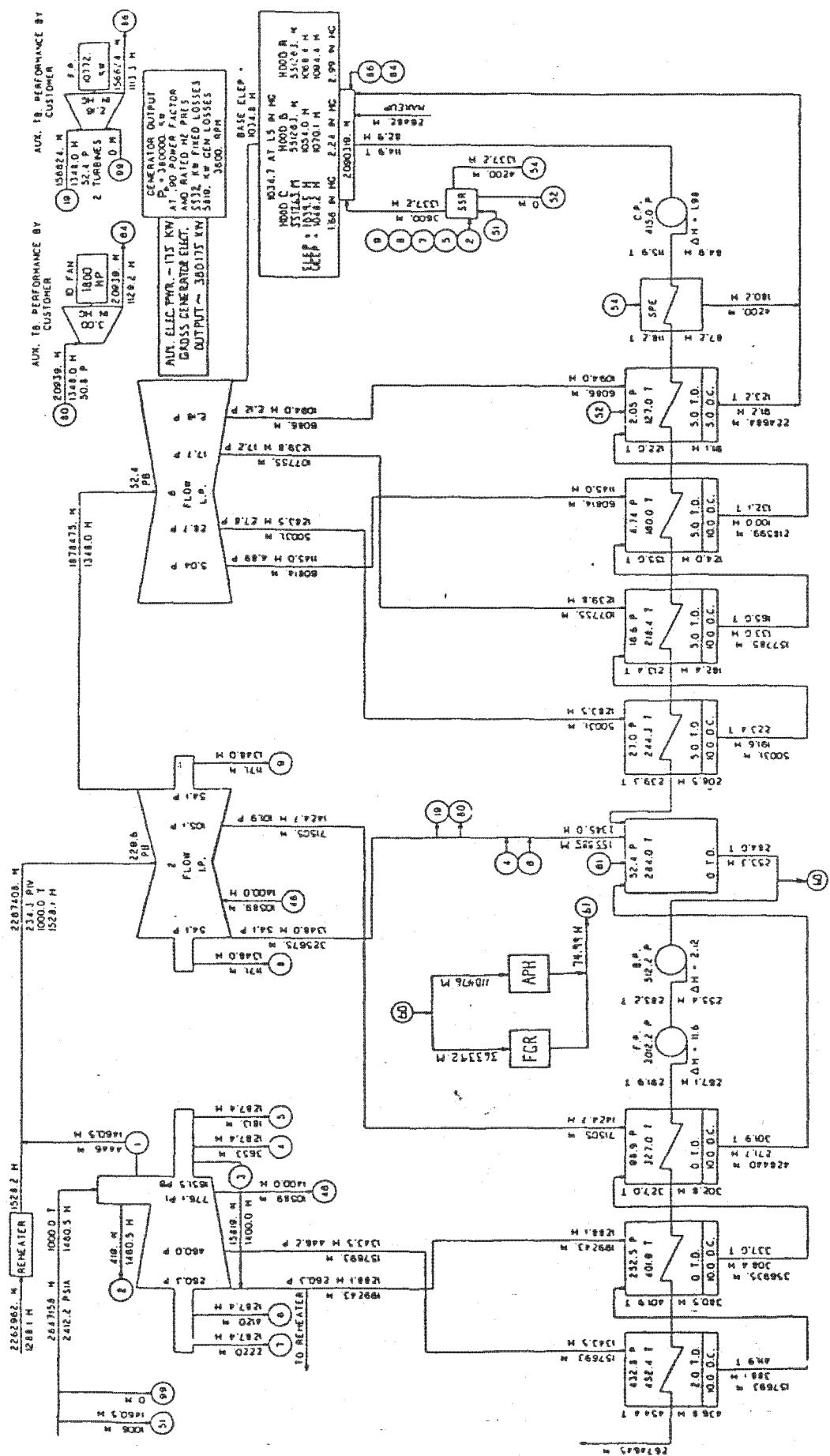
2400 PSIG 1000. / 1000. T  
GEN- 988400. KVA .90 PF LO

Revised 1/28/81

IP7010331

GENERAL ELECTRIC COMPANY, SCHENECTADY, N.Y.

218710002PI 0020  
478 MB 464

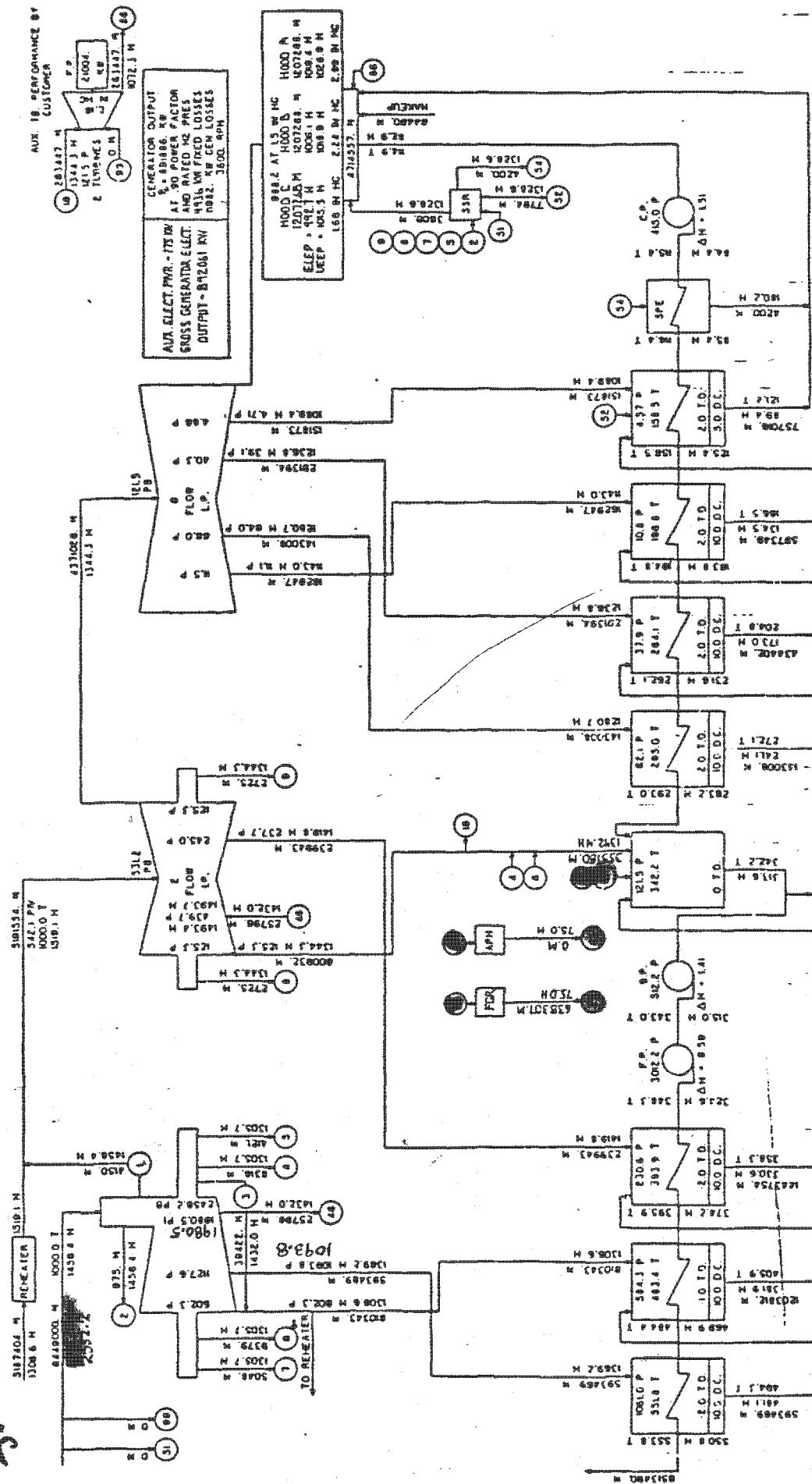


*Release Design GE-HX*

EXTRACTION ARRANGEMENT IS ASSEMBLED ONLY

CALCULATED DATA - NOT GUARANTEED

RATING FLOW IS 383000 M<sup>3</sup>/HR. AT MAIN STEAM CONDITIONS OF 2422 PSIA AND 40000°F.  
TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, CONSIDERING VARIATIONS IN FLOW COEFFICIENTS  
FROM EXPECTED VALUES, SHOWN TOLERANCES ON DRAWING AREAS, ETC., WHICH MAY AFFECT THE FLOW, THE  
TURBINE IS BEING DESIGNED FOR A DESIGN FLOW RATING FLOW PLUS 50 PERCENT OF ENTITLED FLOW.  
THE EQUIVALENT DESIGN FLOW AT 83322 PSIA AND 4000°F IS 488000 M<sup>3</sup>/HR.



CUSTOMER DEFINED VALVE BEST POINT = 6448000 M<sup>3</sup>/HR. 550 PSIA + 107404 M<sup>3</sup>/HR. 1306.6H + 107404 M<sup>3</sup>/HR. 6449 M<sup>3</sup>/HR. 550 PSIA  
NET MEAN RATE = 6448000 M<sup>3</sup>/HR. 550 PSIA + 107404 M<sup>3</sup>/HR. 1306.6H + 107404 M<sup>3</sup>/HR. 6449 M<sup>3</sup>/HR. 550 PSIA

LEGEND: CALCULATIONS BASED  
ON 100% ASME STEAM TABLES  
FLOW-LB/MIN. / PSIA.  
PRESSURE-PSIA  
ENTHALPY-BTU/LB  
TEMPERATURE-DEGREES  
F

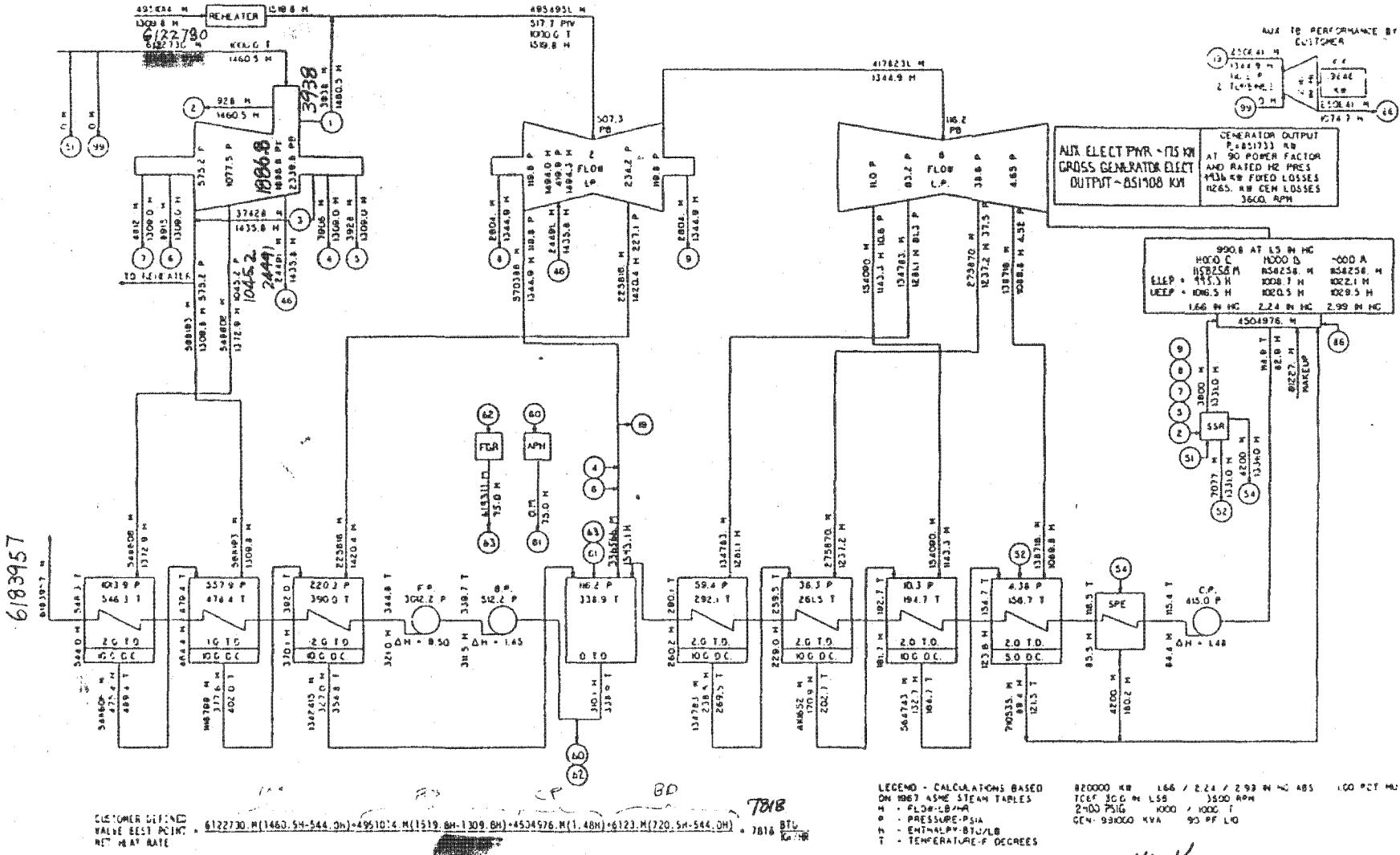
VNO + OF

IP7010333

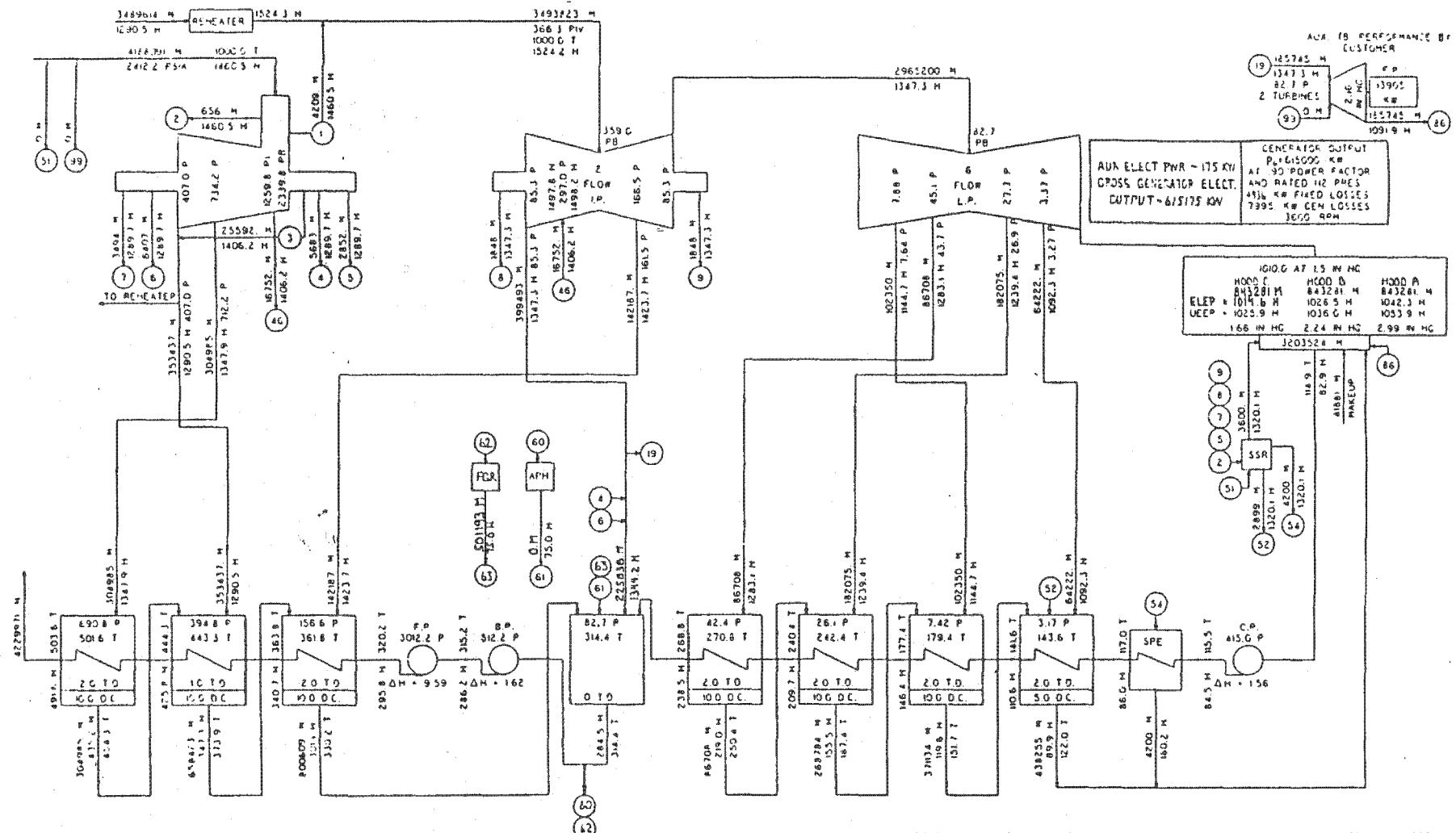
EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY  
CALCULATED DATA NOT GUARANTEED

RATING FLOW IS 253071 M<sup>3</sup>/HR AT INLET STEAM CONDITIONS OF 2412 LBS/IN<sup>2</sup> AND 1000°F. TO ASSURE THAT THE TURBINE WILL PASS THIS FLOW, CONSERVATIVE VARIATIONS IN FLOW COEFFICIENTS FROM EXPECTED VALUES, INLET TOLERANCES ON LEADING EDGES, ETC. WHICH MAY AFFECT THE FLOW. THE TURBINE IS BEING DESIGNED FOR A DESIGN FLOW RATING FLOW PLUS 15 PERCENT OF 253071 M<sup>3</sup>/HR.

4951014







CUSTOMER DEFINED  
VALVE SET POINT =  $4 \times 16291 \text{ M}(1480.5 \text{ H} - 651.6 \text{ H}) + 3489616 \text{ M}(1524.3 \text{ H} - 1290.5 \text{ H}) + 3201524 \text{ M}(1.56 \text{ H}) + 4188 \text{ M}(720.5 \text{ H} - 491.6 \text{ H}) + 7938 \text{ BTU}$   
NET HEAT RATE

LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
H = FLOW-LB/HR  
P = PRESSURE-PSIA  
H = ENTHALPY-BTU/LB  
T = TEMPERATURE-F DEGREES

820000 KW 166 x 2.24 x 2.99 in HG ABS. 100 PCT MU  
TC6P 360 in. LSP 3600 RPM  
240 PSIG 1000 / 1000 T  
GEN- 991000 KVA 90 PF LIO

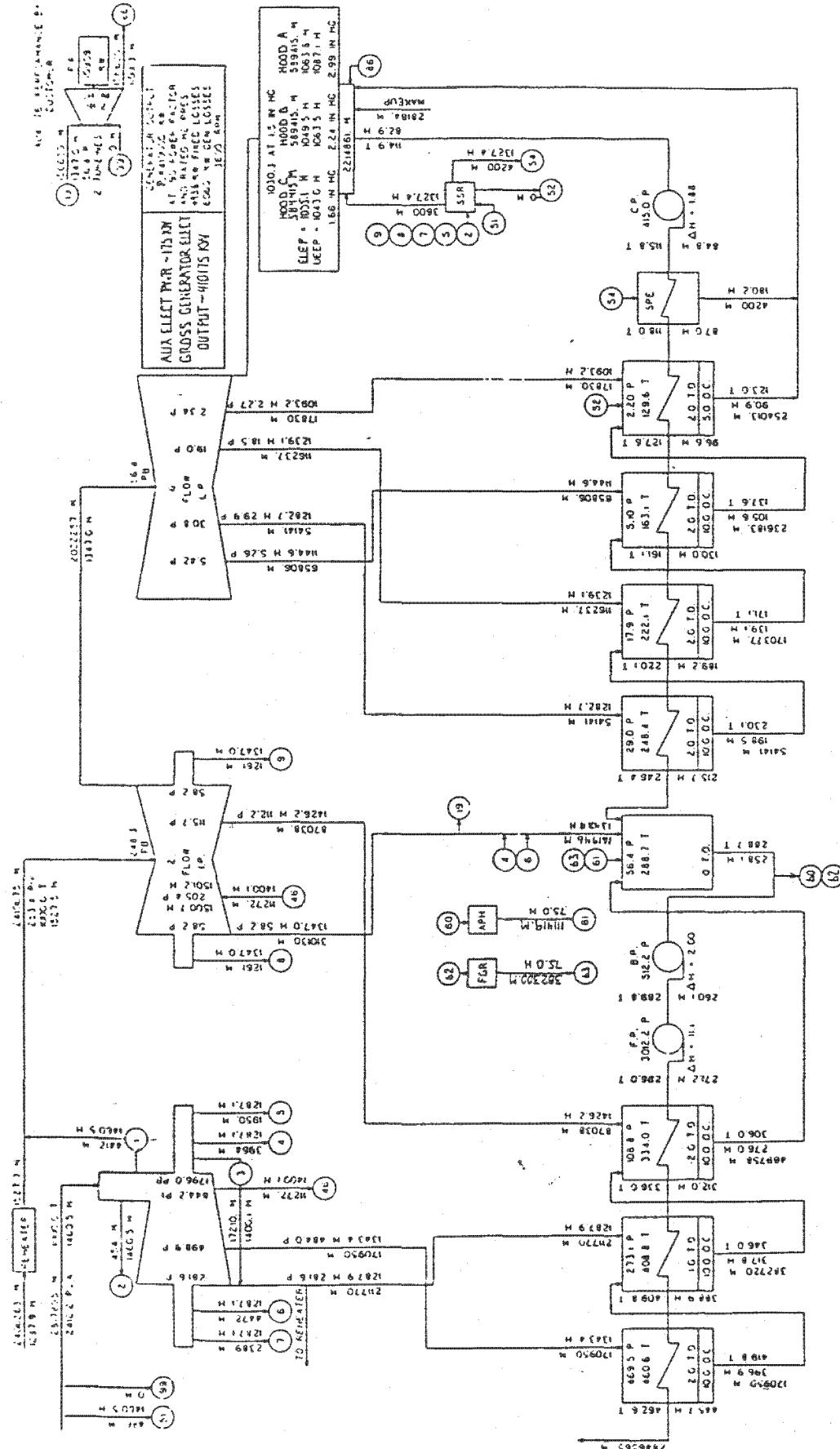
75%

VP#3

KW  
75%  
(15 min)

KW  
75%  
(15 min)

53441 1 080291 6840 0 13  
881 MB 146 7-17-81



CLUTCHER DEFEND: 2817695 H (1460 SM-455 TH) + 2406263 H (1527 TH-1287 TH) + 2214861 H (720 SM-445 TH) = 8394 BTU  
VALVE BLOW POINT: 2817695 H (1460 SM-455 TH) + 2406263 H (1527 TH-1287 TH) + 2818 H (720 SM-445 TH) = 8394 BTU  
NET HEAT RATE

GENERAL ELECTRIC COMPANY SCHEMATIC NO. 4

481-147

LEGEND - CALCULATIONS BASED ON 1967 ASME STEAM TABLES  
1. THERMODYNAMIC TABLES  
2. DENSITY/MASS  
3. PRESSURE/PSEA  
4. X  
5. ENTROPY/SI  
6. TEMPERATURE/F-DEGREES

53441 H (14005 H) 46G2 0 14 1-17-41

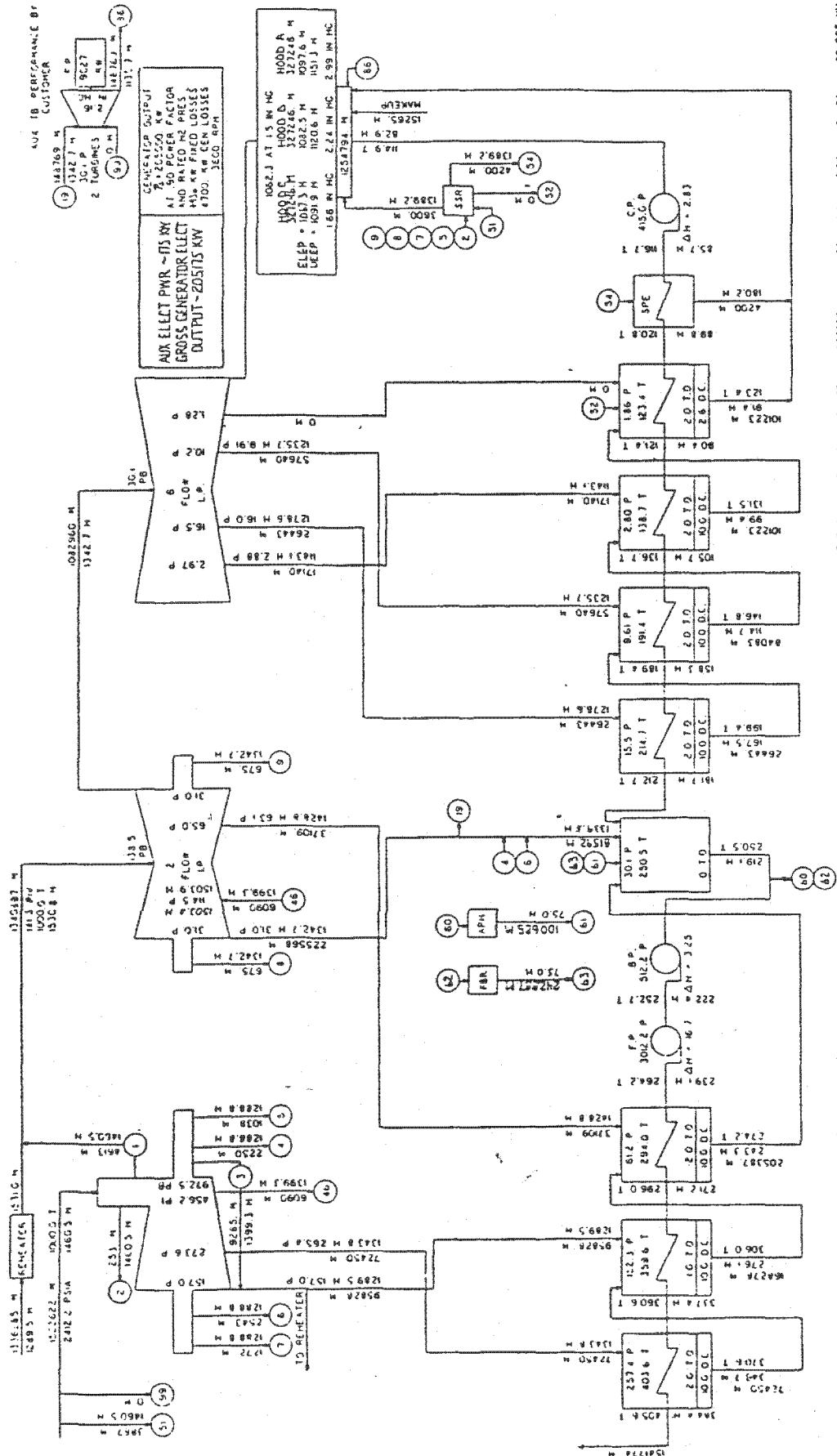
53441 H (14005 H) 46G2 0 14 1-17-41

50%

S.O. / D  
(L.L.)

IP7010337

EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY



LEGEND - CALCULATIONS BASED  
ON 1963 ASME STEAM TABLES  
P = FLUID PRESSURE  
T = PRESSURE-PSA  
ΔH = ENTHALPY BTU/LB  
ΔT = TEMPERATURE DEGREES

CUSTOMER DEF'D. : 1524794 M(140.5H-38.4H)+136295 M(151.0H-289.5H)+1254794 M(151.0H-289.5H)+1254794 M(151.0H-289.5H) BTU  
VALVE SET POINT : 1524794 M(140.5H-38.4H)+136295 M(151.0H-289.5H)+1254794 M(151.0H-289.5H)+1254794 M(151.0H-289.5H)  
NET HEAT RATE

GENERAL ELECTRIC COMPANY SCHEMATIC ONLY

5344F1 D0029 2446 0.15 7-17-81

*Ken Korn*

5344F1 D0029 2446 0.15 7-17-81

25%

IP7010338

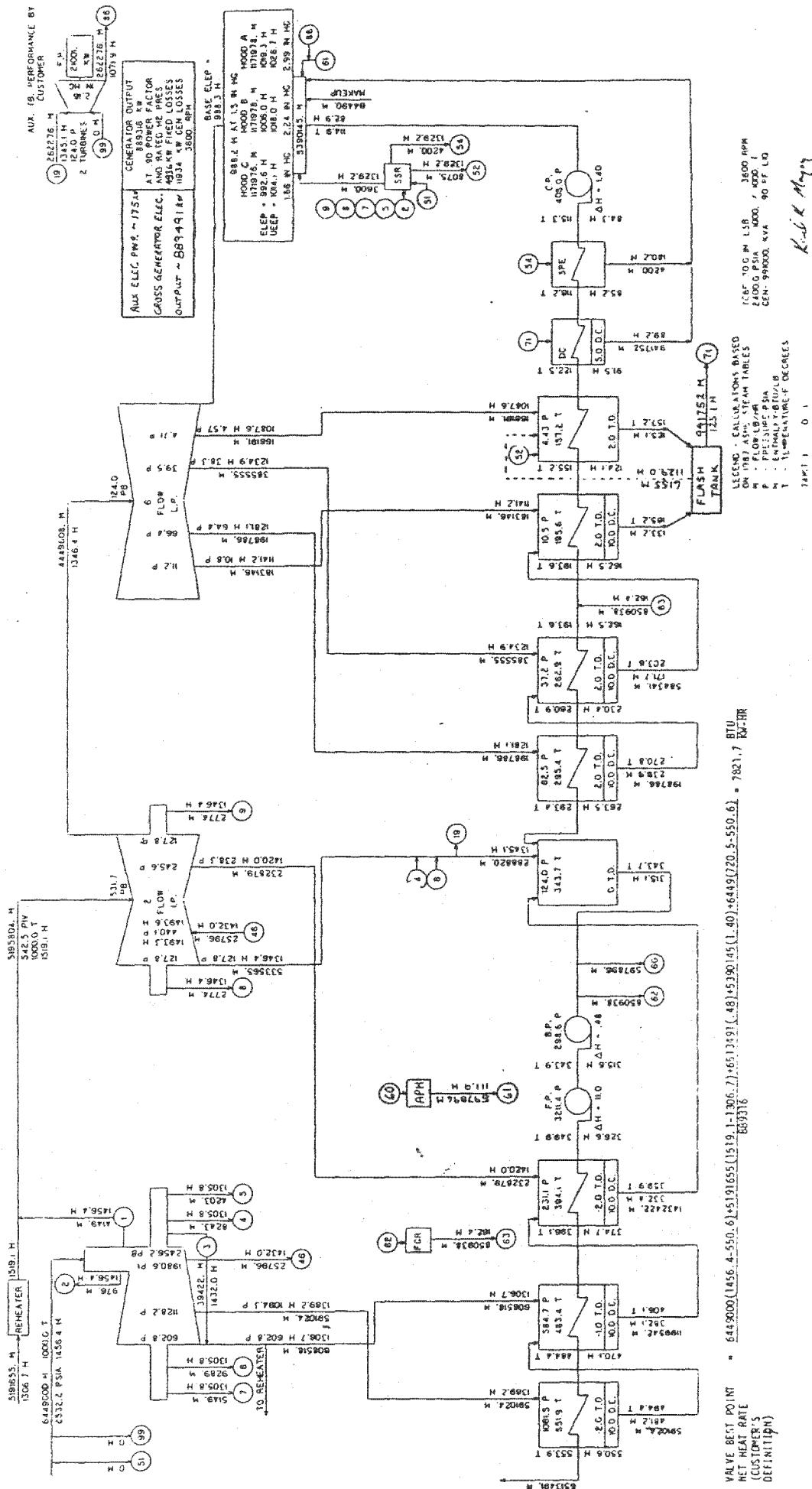
*Submitted*

481-48-784

FOR STUDY PURPOSES ONLY

TURBINE AND EXTRATION ARRANGEMENT IS SCHEMATIC ONLY

RATING FLOW IS 58107.1 M<sup>3</sup>/SEC. AT INLET STEAM CONDITIONS OF 2512.2 PSIA AND 1000.0 °C.  
TO ASSUME THAT THE TURBINE WILL PASS THIS FLOW CONSIDERING VARIATIONS IN FLOW COEFFICIENTS  
FROM EXPECTED VALUES. SHOT TOLERANCES ON DRIVING AREAS, ETC., WHICH MAY AFFECT THE FLOW RATE.  
TURBINE IS BEING DESIGNED FOR A DESIGN FLOW AT 2512.2 PSIA PLUS 5.0 PERCENT OF 58273.0 M<sup>3</sup>/SEC.  
THE EQUIVALENT DESIGN FLOW AT 2512.2 PSIA AND 1000.0 °C IS 58400.0 M<sup>3</sup>/SEC. THE BALANCE OF  
THE VALUE OF GENERATOR DUE TO SHOT SHOWN ON THIS SHEET BALANCE AFTER ALL POWER FOR  
EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED.



481 NO. 144

8/10/64

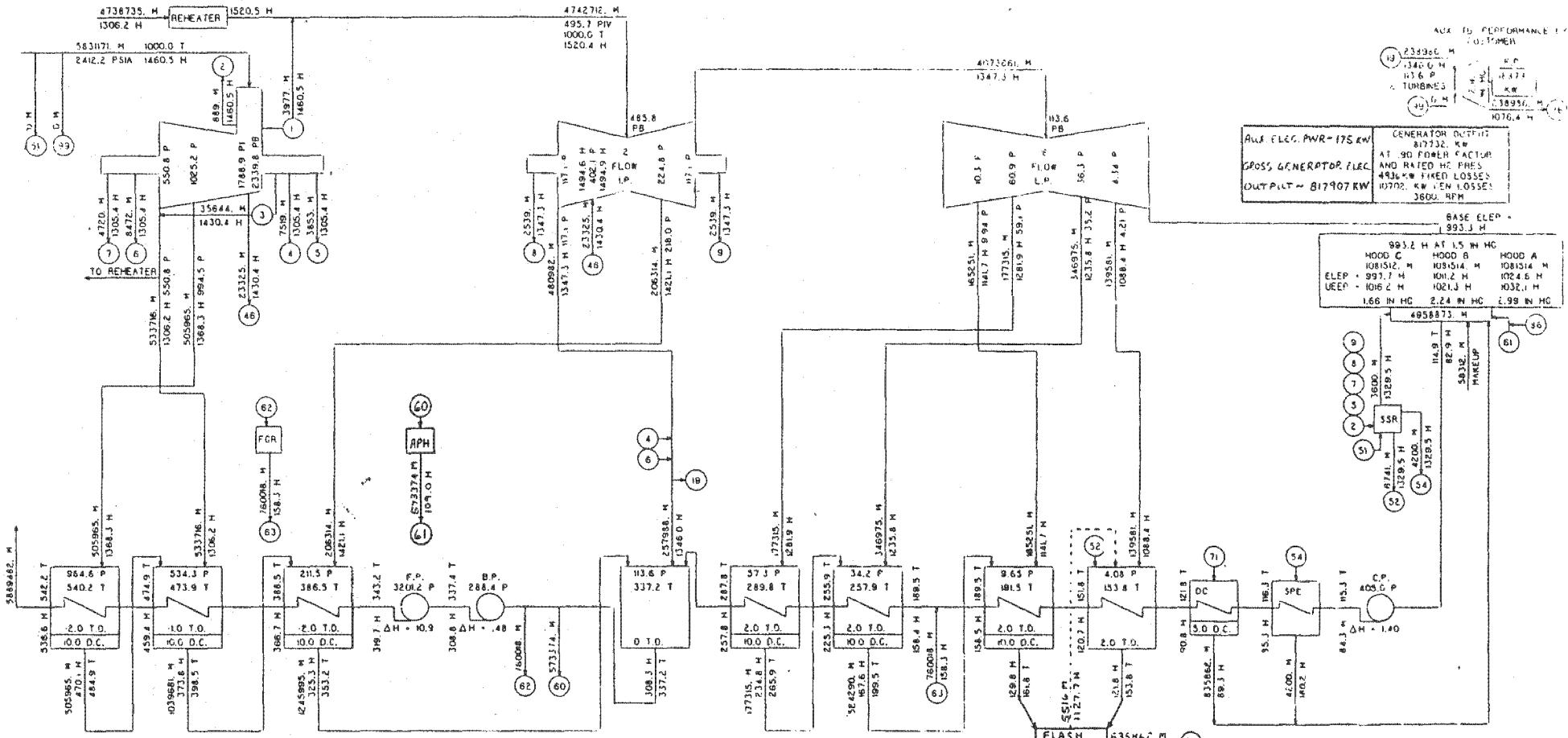
IP7010339



FOR STUDY PURPOSES ONLY

TURBINE AND EXTRATION ARRANGEMENT IS SCHEMATIC ONLY

THE VALUE OF GENERATOR UNIT SHOWN ON THIS HEAT BALANCE IS AFTER ALL FORCES FOR EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED.



LEGEND - CALCULATIONS BASED  
ON 1967 ASME STEAM TABLES  
M - FLOW-LB/HR  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-X DEGREES

TURB 1 0 3

176F 30G W. LSB  
2400.0 PIA 1000. / 1000. T  
GEN- 991000 KVA 90 FF LIO

K.D.K. Mayoy

481 HD 785

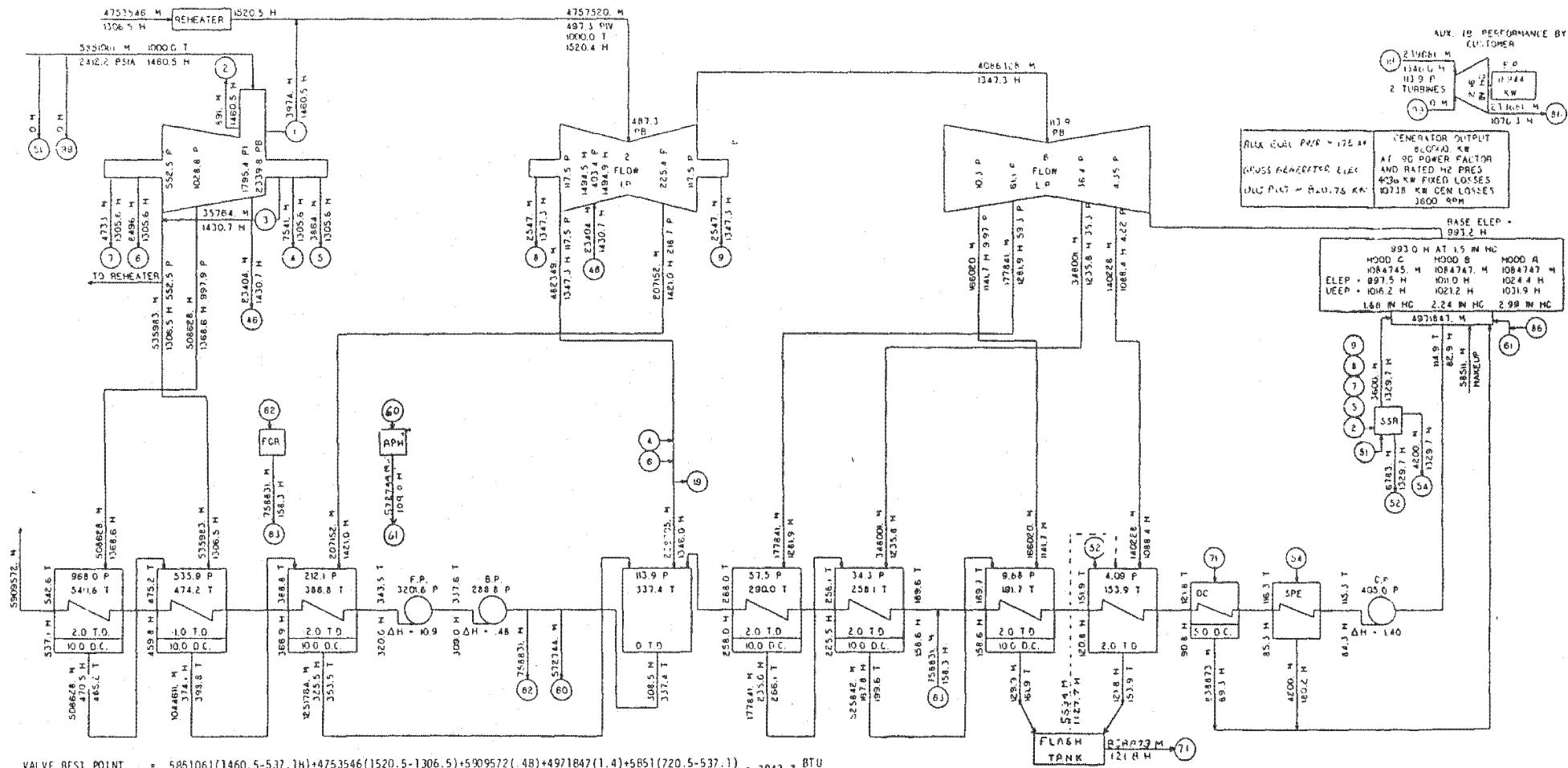
6/10/72

TURBINE AND EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

CALCULATED DATA - NOT GUARANTEED

FOR STUDY PURPOSES ONLY

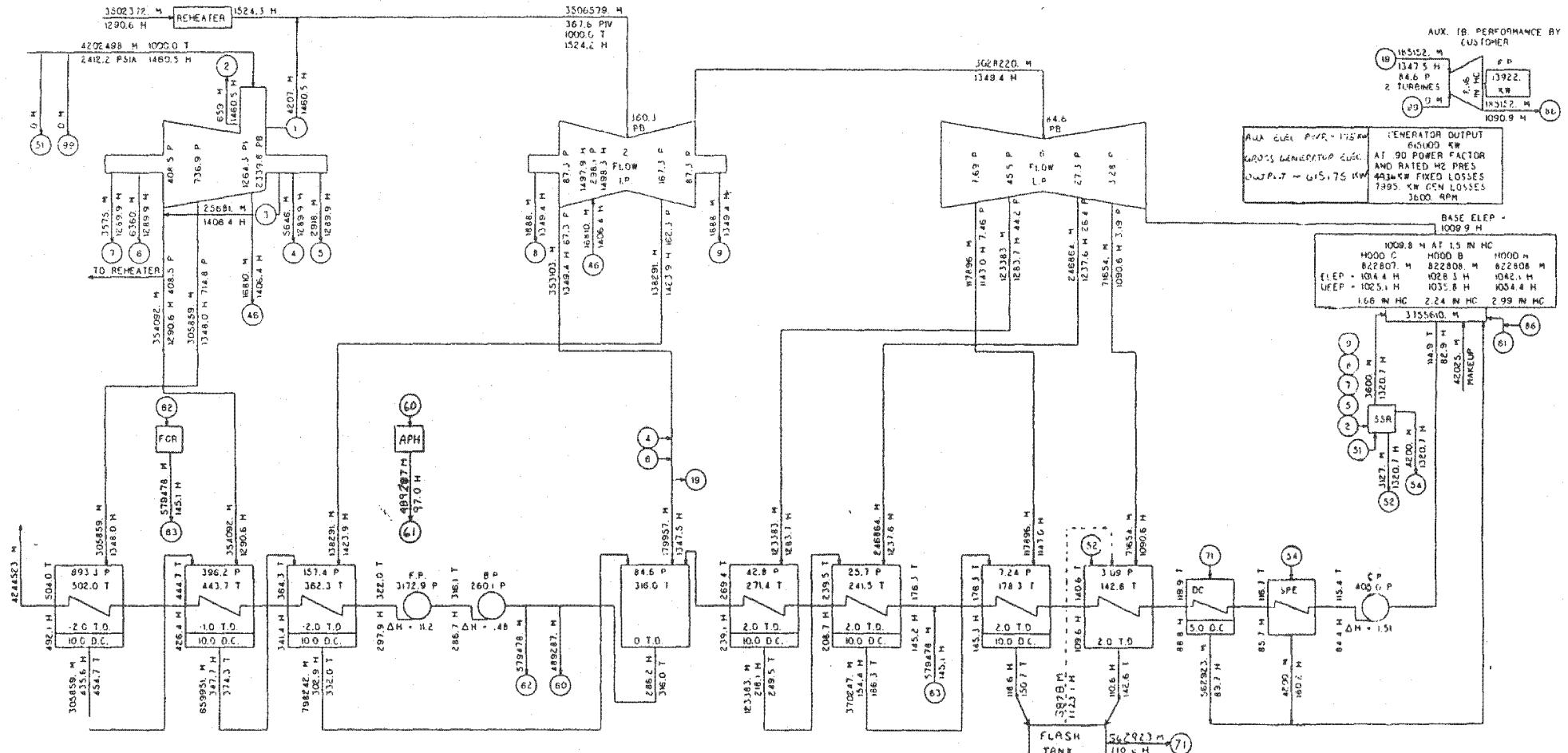
RATING FLOW IS 5851061 M<sup>3</sup>/H AT INLET STEAM CONDITIONS OF 2410.2 PSIA AND 1000.0 °F.  
TO ENSURE THAT THE TURBINE WILL PASS THIS FLOW CONSIDERING VARIATION IN FLOW COEFFICIENTS  
FROM EXPECTED VALUES, SHOT TOLERANCES ON DRAWN AREA, ETC., WHICH MAY AFFECT THE FLOW, THE  
TURBINE IS BEING DESIGNED FOR A DESIGN FLOW RATING FLOW WHICH IS 50 PERCENT OF 622710 M<sup>3</sup>/H.  
THE VALUE OF GENERATOR OUTPUT SHOWN ON THIS HEAT BALANCE IS AFTER ALL POWER FOR  
EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED.



FOR STUDY PURPOSES ONLY

TURBINE AND EXTRACTION ARRANGEMENT IN SCHEMATIC ONLY

THE VALUE OF GENERATOR OUTPUT SHOWN ON THIS MEAN BALANCE IS AFTER ALL POWER FOR EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED



$$\text{VALVE BEST POINT} = 4202498(1460.5-492.1) + 3502372(1524.3-1290.6) + 4244523(-48) + 3755610(1.51) + 4202(720.5-492.1) = 7962.4 \text{ BTU}/\text{lbm}$$

(NET HEAT RATE  
(CUSTOMER'S  
DEFINITION))

LEGEND: CALCULATION: BASED  
ON 1967 ASME STEAM TABLES  
M - FLOW-LB/H  
P - PRESSURE-PSIA  
H - ENTHALPY-BTU/LB  
T - TEMPERATURE-DEGREES

1000.0 H IN LSP 3600 RPM  
2400.0 PSIA 1000. / 1000. T  
LEN 091000. KVA 90 PF 1.0

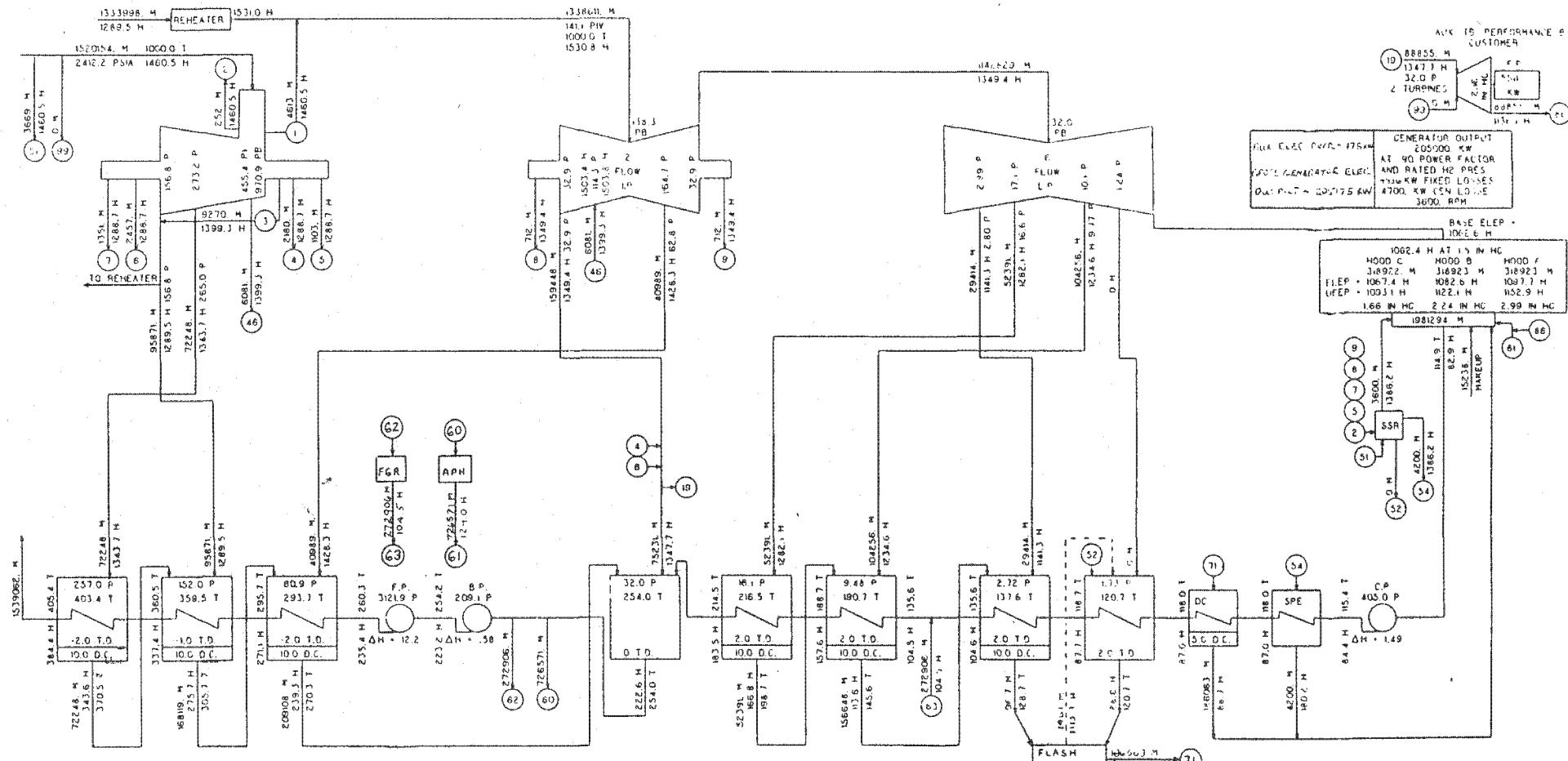
K. K. Mayag



FOR STUDY PURPOSES ONLY

TURBINE AND EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY

THE VALUE OF GENERATOR OUTPUT SHOWN ON THIS HEAT BALANCE IS AFTER ALL POWER FOR EXCITATION AND OTHER TURBINE GENERATOR ALLOWANCES HAS BEEN DEDUCTED



LEUTING CALCULATIONS BASED  
ON 100% ANME STEAM TABLES  
• FLOW IN/OUT  
• PRESSURE IN/OUT  
• ENTHALPY-BY-UNIT  
T - TEMPERATURE IN DEGREES

ICBF 30.0 IN L58 3000 RPM  
24000 PSIA 1000 °F 1000 I  
GEN 991000 KVA 90 PF LIO

Kirk McKey